TWENTY-SIXTH DAY.

Wilmington, Delaware, July 13, 1923,
at 8.30 o'clock A. M. Standard Time.

Before:

HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. KRESEL: May it please your Honor, if you will permit me, I should like to interrupt the examination of Professor Stieglitz to call a representative of the Tariff Commission, who is here, and who is very anxious to get back to his duties. It will take only a few minutes. Any objection, Colonel?

MR. ANDERSON: Not at all.

JULIUS STIEGLITZ, resumed the witness stand.

DIRECT EXAMINATION (Continued).

By MR. KRESEL:

Q. 94. Professor Stieglitz, I omitted to ask you yesterday whether you had ever testified as an expert?

A. I have never before testified as an expert.

Q. 95. This is your first experience on the stand as an expert witness?

A. I have always declined to be consultant for commercial cases, and have only appeared in the public interest.

Q. 96. You spoke yesterday, Professor, of being able to demonstrate to the Court in a very brief space of time that you can take this essential element anilin and turn it either into a dye or into a war gas. How

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long would it take you to really show that to the Court?

A. I think about ten minutes. As I stated, the war gas is not one of the best. It is pungent enough, and if inhaled, we will all be sick of it. I prepared a little this morning and still feel it. The medicament is not one of the best, but it is a popular headache remedy. The dye is not one of the best. It is not very stable, though I have some on my finger here. But they have the advantage of being able to be produced speedily. So that if a demonstration is wanted, I could carry it out.

MR. KRESEL: I do not want to impose upon the Court.

THE COURT: I should be very glad to see a demonstration. You have no objection, Colonel Anderson, have you?

MR. ANDERSON: No, I am perfectly willing to admit all that the demonstration will show on the record, but I will be very glad to see it as a diversion from the strain of the trial.

(Witness makes demonstration at this point.)

THE WITNESS: Your Honor, that is what we call anilin, one of the common basic materials in the dye industry, for the preparation of explosives, stink gases or tear gases, and it can be used for the preparation of medicaments. I will first convert it into a stink gas.

Q. 97. Would you mind saying what you are doing with it, as you are doing it?

A. I am adding to this what we call alcoholic potash solution and a little chloroform. If you want to inhale a little of it, just blow it toward you. Do not put it close to the nose, because it is rather powerful. Take hold of it up here because it is too hot. May I pass it to you, Judge?

THE COURT: Yes.

THE WITNESS: Just blow a little toward you. Colonel Anderson, would you take a little?

MR. ANDERSON: No, thank you. I have been through it. I don't want to try it any more. I know what it is.

THE WITNESS: I think it had better be taken out of the room now.

MR. KNIGHT: It does not seem bad enough to win a war.

THE WITNESS: It is a stink gas, and I say, with time, we can make worse, Mr. Knight. These are chosen on account of the speed of illustration.

The second experiment will show how we can use the same material for the preparation of a medicament, acetanilid.

By MR. KRESEL:

Q. 98. Used for what purpose?

A. It is a popular headache remedy; not one I would recommend, but extensively used.

I will mix it with some acetylchloride, as we call it. The reaction is a rather violent one. You see, it is taking place already, by the gases. The solution is hot and the acetanilid is in solution. You can see the solid, though, on the sides of the vessel here, and when that cools we will have the crystallized acetanilid. (Exhibiting test tube and contents.)

Now, the third experiment I would make is the use of the aniline to produce a dye—not one that would make a man wealthy, but one that is quickly produced. I will take a single drop of it, and will add to it a solution of chloride of iron. Here is a dye. (Exhibiting test tube and contents.)

I think that is sufficient.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 99. Dr. Stieglitz, you became a member of an Advisory Committee of The Chemical Foundation

in 1919, did you not, on pharmaceuticals and licensing?

A. I did. When The Chemical Foundation took over the patents, I asked at that time the Alien Property Custodian, Mr. Palmer, to keep up the protection of the quality and price of arsphenamine that had been granted to it by the Federal Trade Commission, and asked him to recommend to Mr. Garvan that this protection be still continued in the care of the United States Public Health Service, and as a result The Chemical Foundation asked us to act as an Advisory Committee—Dr. McCoy, Mr. Edward S. Rogers, of the Federal Trade Commission, and myself.

XQ. 100. I hand you copy of a letter dated May 3, 1919, from yourself to Mr. Garvan. You recall that letter, do you not?

A. Yes.

XQ. 101. And a letter dated May 9, 1919, from Mr. Garvan to you in reply?

A. Yes.

MR. ANDERSON: Mr. Kresel, the second letter has not Mr. Garvan's signature. You will not object to that, will you?

MR. KRESEL: Probably not; let me see it.

XQ. 102. While counsel are examining these letters; who was Mr. Edward S. Rogers? You say he was a representative of the Federal Trade Commission?

A. He was one of the lawyers of the Federal Trade Commission.

XQ. 103. And Dr. McCoy, I think you testified, was the head of the United States Public Health Service?

A. No, he is director. He is not the head of the Public Health Service; he is Director of the Hygienic Laboratories of the U. S. Public Health Service.

XQ. 104. Is that committee still continuing?

A. It has not been active, I imagine, since 1919.

XQ. 105. Since 1919?

A. It only acted for about a year, as I understand.

XQ. 106. About a year?

A. Yes.

XQ. 107. I note from these letters, to which you can refer if you wish to refresh your memory, that the committee was to advise as to the granting of licenses covering the manufacture of pharmaceuticals. That was your understanding, was it not?

A. Yes.

XQ. 108. And in this letter of May 3d you did recommend the licensing of Mallinckrodt?

A. Mallinckrodt and Squibs, I believe.

XQ. 109. Of St. Louis?

A. Yes.

MR. ANDERSON: I would ask leave to introduce in evidence the letter that has been identified by the witness, dated May 3, 1919, addressed to Francis P. Garvan and signed by Dr. Stieglitz, to be read as Plaintiff's Exhibit No. 640.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 640." (*See Exhibits, Vol. III, page 1549.*)

MR. ANDERSON: I ask leave to introduce in evidence the letter of May 9, 1919, addressed to Dr. Stieglitz and signed by Mr. Garvan.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 641." (*See Exhibits, Vol. III, page 1551.*)

XQ. 110. Doctor, have you had any other connection with The Chemical Foundation since its organization?

A. I was one of a group of nine, I believe, scientific men who prepared for the Foundation the pamphlet called The Future Independence and Progress

of American Medicine in the Age of Chemistry. I have other copies in Chicago. I would not like to give this up.

MR. KRESEL: There is a copy here marked for identification, so that can be used.

THE WITNESS: The men are named on the first page.

MR. KRESEL: We put that in. That was put in by me under Mr. Garvan's examination.

XQ. 111. That was prepared by you and the other gentlemen named for The Chemcial Foundation?

A. For The Chemical Foundation.

XQ. 112. It was published by The Chemical Foundation and distributed by them?

A. It was.

XQ. 113. I do not wish to ask any personal questions, but is that the book you spoke of yesterday and stated that they still owe you for?

A. Yes.

THE COURT: I did not hear that question.

MR. ANDERSON: He mentioned it in connection with the question of his financial interest in The Chemical Foundation.

THE WITNESS: May I make a statement, Colonel?

XQ. 114. I have no objection to your making a statement now on that subject.

A. A conference was held in New York at which Mr. Garvan said that it was exceedingly important to educate the public in regard to the connection between chemistry and medicine, and it was stated at the time by myself and others that the scientific men would be glad to contribute their services without compensation. But Mr. Garvan insisted that it would take quite a little time, he wanted a thorough piece of work, and he thought it was only fair that the men doing that work should receive compensation.

XQ. 115. I am very glad to get that statement. You said you wrote the preface to the book called "Creative Chemistry," which has been introduced here as one of the books distributed by The Chemical Foundation.

A. It was published as an article by The Independent, I think, under a title something like Chemistry and the Life of the Nation. I wrote that.

XQ. 116. You wrote it?

A. I wrote that.

XQ. 117. I believe that you said, Doctor, that you had no present connection with The Chemical Foundation other than you have indicated?

A. Not that I am aware of.

XQ. 118. Do you practice your profession as a consulting chemist? I did not quite understand what you said.

A. I have persistently for thirty years declined to be a consulting chemist.

XQ. 119. I did not get that clear.

A. I only serve in the public service.

XQ. 120. Your work is that of a professor of chemistry and laboratory work then, altogether, is it not?

A. Yes, especially research training and research work, and carrying out of my own research work.

XQ. 121. I understand. You do not deal with the industrial phases of the subject at all, except to the extent necessary to instruct your people, and to carry that forward; is that true?

A. Only to the extent that the fundamentals of industry are theoretical sciences.

XQ. 122. I understand. Now, Doctor, you spoke yesterday of research work in the development of these various medical pharmaceutical products. Is it not a fact that in chemistry, a certain amount of actual and practical experience in the production of any prod-

uct or the application of any process, is necessary to develop it?

A. It is to this extent, Colonel—one of the most famous organic chemists in the history of the subject was my old instructor, Hofmann, a German, and he said the first time you do something, you get a poor result; the second time it will be better, and the third time you should be sure. That is correct now.

XQ. 123. And very often in these very complicated chemical reactions, it takes quite a good deal of experimentation to develop a satisfactory product, does it not?

A. If the instructions are definite, we should at the third trial get perfect results in synthetic chemistry.

XQ. 124. That brings up another question, I suppose, the human factor in chemistry is as variable as it is in other lines of business, is it not-

A. Certainly.

XQ. 125. One chemist will get results where another chemist will not, working along the same lines; is that not true?

A. I am referring to the average good chemist, not to the exceptionally good or exceptionally poor chemist.

XQ. 126. I understand; but even the same chemist, using what he thinks to be the same ingredients or intermediates, very often gets different reactions, does he not?

A. Well, he might the first time, but if he has any keen flair and turn for chemistry, he would do better the second time, and should solve his problem every third time, for known reactions for which the instructions are given.

XQ. 127. Are not the reactions also largely affected by the intermediates used, or ingredients?

A. Certainly.

XQ. 128. In other words, a slight variation in the ingredient or intermediate, such as you used in your very interesting experiment a few moments ago, might very much affect the technical result, would it not?

A. Quite right, but may I add that it is part of the chemist's duty to identify and make sure of his material.

XQ. 129. Yes. Now, taking the subject of development of these processes; is it not a fact, Doctor, that you are constantly improving and developing the quality and clinical value of medical products of that kind by experimentation?

A. I would not say that. You are referring to not new products, but standard products.

XQ. 130. I am referring to products such as salvarsan, novocain, luminal, things of that kind?

A. Yes.

XQ. 131. That you are constantly improving the standard and clinical value of these products, are you not?

A. I think that is a question of each individual. For instance, novocain or procaino can be prepared pure. We have made no progress in preparing it purer than pure.

XQ. 132. You spoke of Dr. Hofmann, your old instructor. He was one of the greatest chemists of his time, was he not?

A. He is one of the founders of modern organic chemistry.

XQ. 133. Doctor, you appeared before the Senate Committee on Finance in a hearing on what we have defined as House Bill 8078. You recall that?

A. I did. I recall that.

XQ. 134. At page 54 of that hearing, I read from your statement the following, which will save me the trouble of a number of questions, perhaps:

"Now, I want to make two points, to draw two lessons from our experience with synthetic drugs. The first is this: It is only a question of time until we can succeed in solving all the intricate problems connected with any compound whatsoever, whether it is a drug or a dye. Probably it would take only two years with any individual dye, which would be my estimate, to produce it in quantity so that we could even export it. The difficulty with the manufacture of dyes is that there are not half a dozen dyes, as there are essential drugs, but a large number. They cannot take hold of them all at the same time; they must solve one problem after another. But, taking up one problem after the other, I think it is probably a matter of only two, or perhaps three, years on an average before production on a commercial scale can be successful."

That is a pretty accurate and complete statement of the problem, is it not?

A. That would be my judgment of the matter.

XQ. 135 You spoke on yesterday of your experience in making luminal, I think, in 1917, did you not?

A. I did. I have my report, Colonel, if I may take it. I can give you the exact date. The work was done with a Dr. Mary Rising, and the report was published in January, 1920, in the Journal of the American Chemical Society.

XQ. 136. Before asking you about luminal, in connection with my inquiry as to the process of development, if I might call it, of commercial or industrial production, I would like to read you one other statement which you made at page 57 in regard to rhodamine B, one of the famous dyes, as you stated.

There, you were quoted as saying, in reply to a question by Senator Curtis, "You do not think there is any doubt about that," referring to the power of the United States to make it or the ability of the United States to make it:

"I have not the least doubt about the result, because we have already been successful with other dyes and with drugs. It is only a question of time when, instead of getting a yield, say, of one-tenth of 1 per cent., we will get a yield of 90 per cent. That makes a difference of 900 fold, you see. If you get a yield of one-tenth of 1 per cent. instead of 90 per cent. the cost of the commodity is 900 times as great. We are continually improving the yields."

That is true in your chemical development?

A. That is essentially the history of commercial development.

XQ. 137. With respect to luminal, returning to that subject, you make this statement, which I read you merely because it abbreviates asking a lot of questions, at page 57. "That was the one drug which we were not prepared to make"——

MR. KRESEL: Just a minute, Colonel, won't you read so as to connect it up, the two preceding paragraphs beginning "I could give you one other instance if you have the time"? There is where he starts talking about luminal.

MR. ANDERSON: Yes, I have no objection to reading it. I only want to get Dr. Stieglitz's statement; I do not want Senator Watson's views, or those of anybody else; but I am perfectly willing to read it.

XQ. 137. (Continued.) You spoke of luminal, and Senator Watson asked: "Is that a successful specific, Doctor?" And you said, "Yes."

A. Specific for epilepsy.

XQ. 138. Yes, you spoke of luminal as a remedy for epilepsy.

A. To prevent seizures in epilepsy.

XQ. 139. Yes, to prevent seizures in epilepsy, you testified to that on yesterday. And Senator Watson

asked, "Is that a successful specific, Doctor?" And you said: "Yes. The pathetic letters on file in my office in connection with luminal are even more heart-rending, perhaps, than those in connection with the other drugs.

That was the one drug which we were not prepared to make at the end of 1917. So we took it up at the University of Chicago, tried the process described in the patent, and got just enough to look at it; not enough to send to a single patient for treatment for epilepsy. So my assistant, Miss Rising, set about modifying the method, and we very quickly developed a method—within six or seven weeks—which gave yields in excellent quantity, avoiding everything that was expensive and difficult, and we put the process at the disposal of any manufacturer who wanted to use it. Luminal is now made in this country."

That is correct, is it not?

A. When was this?

XQ. 140. This was in 1919-1920. That is a correct statement, is it not?

A. I would like to state that luminal, while it was made in this country, was not put on the market, as far as I know, until a little later. You see, the commercial development lags behind the laboratory development. I was very much disappointed; but as far as I recollect, Colonel, it may have been a little later than 1920.

XQ. 141. Luminal was, in fact, a patented drug, was it not?

A. Luminal was a product patent, and claimed, during the war, to be the property of the American concern.

XQ. 142. Yes.

A. And for that reason——

XQ. 143. That is all, Doctor. I do not want to

go into the history of it. I only wanted to ask you if it was a patented drug; that is all.

A. Yes.

XQ. 144. As I understand, in the production of luminal in your original laboratory experiment following the processes of the patent, it did not give you a satisfactory yield?

A. Yes.

XQ. 145. You got luminal, but you did not get enough to make it a satisfactory or commercial yield?

A. Exactly. May I add a word in explanation, Colonel? And that is, in the latter technical development of luminal, which was undertaken by Merck, they tried method after method, and finally——

XQ. 146. One minute, Doctor. I know you have said you have never been on the stand before as an expert. If we go into the methods of other companies, it immediately opens up a field that I do not care to open up; and therefore, while I do not mean that I would not like to have your explanation, such an explanation opens up matters that we probably would not be permitted to go into, and so I would rather not have you go beyond the question if you can do it

A. I merely wanted to say they adopted this method.

XQ. 147. Yes, that is all right. As long as you can fairly answer the question without going into matters that might open up a new field of examination, I would prefer to have you do so.

Now, coming to the question of salvarsan, I also read from your statement before the Committee, to which I have already referred, at the Hearing on H. R. 8078, page 51. I read the following from your opening statement:

> "Even before we started in the war importations were prevented, and the demand was so

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enormous that for a time absolutely fancy prices were paid for the drug."

You were speaking of salvarsan.

"As soon as it was seen that there would be such a shortage some of the research chemists of the country started preparing arsphenamine, and the results at first, following the patent specifications, were so poor that some of these men thought of appearing in court to have the patents annulled, stating that the product could not be prepared according to the patent specifications. That was wrong; one can prepare arsphenamine according to patent specifications, but just about enough to look at, not enough to use. It is altogether a question of yield."

Is that a correct statement of the experience at that time?

A. It is also a question of toxicity, Colonel, a question of toxicity; its poisonous character.

XQ. 148. Did you, in fact, prepare any salvarsan under the patent yourself?

A. I had two assistants, Colonel, and I would like to explain just what we did, because it is a vital question.

We entered into this work in May, 1918, on demand of the Public Health Service to meet a serious war emergency in which very serious results had been obtained in the use of a product supplied to the Army; so that we had advance information that the product produced was liable to be exceedingly poisonous. We knew that this company had not only the patent specifications, but specific instructions from the manufacturing house in Europe, and for that reason I and my assistants——

XQ. 149. One moment, Doctor.

MR. ANDERSON: If the Court please, I want to

get the facts, and I do not wish to be arbitrary in limiting Dr. Stieglitz to specific answers to questions; but, of course, this is very far removed from my question and is going into a subject which I do not think, as I now see it, I would probably be allowed to go into on your Honor's rulings. I know Dr. Stieglitz does not understand these technical questions. I am constrained, therefore, to ask that the answer be stricken out and that Dr. Stieglitz be directed to make a specific reply. I will try to be fair in my examination, in order that he may give the essential facts of his experience.

THE WITNESS: Your Honor, before you rule, may I explain we followed the patent specifications with improvements.

MR. KRESEL: Will your Honor hear me just a minute?

THE COURT: Yes.

MR. KRESEL: I do not understand what ruling of your Honor it is to which Colonel Anderson refers, which would prevent him from going into this subject. I do not understand that there is any such ruling.

MR. ANDERSON: In any event, I shall not go into that discussion now of your Honor's rulings. With your Honor's permission, I will merely move, with all possible deference to Dr. Stieglitz, because we are dealing with technical questions, that the answer be stricken out, and the question reread and that he answer the question.

MR. KRESEL: Your Honor, we object to striking it out, because it was an answer given with the consent of Colonel Anderson.

MR. ANDERSON: Not at all.

MR. KRESEL: The witness said, "May I ex-

plain?'' and Colonel Anderson did not say that he might not explain, and then he went on.

MR. ANDERSON: I could not very well tell whether he was going to answer directly in explanation.

THE COURT: If, Mr. Kresel, in re-direct you desire to put any questions, I will rule on them then; but under the rules of evidence, as I understand them, I think Colonel Anderson's deference to the witness should not place him in an embarrassing position; so I am going to grant the motion. Will you restate the question?

XQ. 149. The question I asked, Doctor, was if you had personally prepared any salvarsan or undertaken to prepare salvarsan or produce it under the process named in the patent?

THE COURT: And not the reasons for it, Colonel Anderson.

MR. ANDERSON: Just whether you have or have not.

THE COURT: Does that embrace the two assistants to whom he testified? That is, if they were under his immediate supervision or not. I think Dr. Stieglitz is entitled to know that.

MR. ANDERSON: I will first ask him to answer, and if he says he did not do it personally but had two of his assistants do it under his supervision, then I might follow that further.

A. Not personally.

XQ. 150. In the statement which I read from your testimony before the Committee you refer to arsphenamine. Is not arsphenamine the American name for salvarsan, and are they not the same drug?

A. It is the official name adopted by the Federal Trade Commission for salvarsan. They are the same drugs.

XQ. 151. Yes; it means the same thing. Doctor, I

believe you say you were adviser to the Federal Trade Commission in the issuing of licenses to manufacturers of drugs and pharmaceuticals during the war under alien patents?

A. Yes.

XQ. 152. I think you testified that you did, in fact, advise the issuing of four or five licenses; is that so? You need not name them, because they are already in the record.

A. In the early days I think I can remember three. There were later more.

XQ. 153. Two more?

A. Two more.

XQ. 154. Yes, sir; that is my recollection. Do you know whether or not all of those licenses are still manufacturing salvarsan or arsphenamine?

A. As far as I am aware the Takamine Company, which got a license later, withdrew from the field, but I am not certain of the fact.

XQ. 155. But the others, other than the Takamine, are, in fact, manufacturing now?

A. As far as I know, Colonel.

XQ. 156. And they were, in fact, manufacturing late in 1918 and 1919, were they not—say January, 1919, for convenience?

A. Yes.

XQ. 157. They were?

A. They were.

XQ. 158. Do you know whether those manufacturers operating under Federal Trade Commission licenses issued on your advice are selling their product in the United States under label stating that it is so manufactured?

A. At present I could not tell, Colonel. I have had nothing brought to my attention, I imagine, for two years. The manufacturing is organized now, and they do not need my help in regard to arsphenamine.

XQ. 159. In 1919, however, when you were

actively connected with this work, they did manufacture under the Federal Trade licenses; you know that?

A. They did.

XQ. 160. And sold. Salvarsan, you know, is a product patent, do you not? It appears in evidence here.

A. I have seen the patent, but whether it is a product patent or process patent I will leave to the lawyers, Colonel.

XQ. 161. Was it not a requirement during your connection with the Public Health Service that the product of these plants should be submitted to the Public Health Service for tests, say in 1918 and 1919?

A. I think that started in November, 1917. It may have been November, 1918, but I am pretty sure it was November, 1917.

XQ. 162. And that continued on through and it still continues, that regulation, does it not?

A. It still continues.

XQ. 163. And as I understand, Doctor, your statement here that those who complain of the process in the patent were wrong to this extent, that salvarsan could be produced under the patent process; that is a correct statement of the situation, is it not?

A. I have never seen it prepared, Colonel, with sufficient purity to be safely used and injected into the veins, that is the critical question, Colonel. I would not have it introduced into my veins, or into the veins of my son, and for that reason not introduced into the veins of anyone.

XQ. 164. I understand that is a question of purification—the methods of purification are generally known to those learned in the art of chemistry, like yourself, are they not?

A. That is again a critical question, because salvarsan, when prepared in my experience, cannot be purified.

XQ. 165. Cannot be purified?

A. It is pure or it is not.

XQ. 166. I see. You continued, however, to have the production of salvarsan or arsphenamine go on during the years 1918, 1919, under the licenses issued by the Federal Trade Commission, under patent No. 986,148; is that true?

A. That is true.

THE COURT: I am not just sure that I understand that question and answer. I am not suggesting anything further than that fact——

MR. ANDERSON: Does your Honor wish to say something more?

THE COURT: No, because I think you understand what I mean without my making any further suggestions. If you do not, I will be very glad to go into it.

XQ. 167. Doctor, yesterday you were asked about making salvarsan under this process defined in that Patent No. 986,148, and you said that that required additional information, as I recall your answer.

A. The question included the statement that it should be sufficiently non-toxic to be used on human beings.

XQ. 168. Now, you said, with the aid of two of your assistants, under your direction, you made this product in your laboratory; is that true?

A. That is true.

XQ. 169. I would ask you, Doctor, if you would take the patent process and tell us exactly how far the patent process was followed and what additional thing was done or information developed in it; in other words, to the extent of the variation or addition, if you can define it. You understand my question, do you not?

A. I do.

XQ. 170. Following the process down?

A. In the procedure of preparing sodium para-oxyphenylarsinate, we were a little more careful than the patent specifies, and worked at lower temperatures, a little lower temperatures.

XQ. 171. At little lower temperatures?

A. And then the critical question came——

XQ. 172. Would you mind me interrupting you there?

A. Yes.

XQ. 173. What temperature is provided in the patent, and what temperature did you use?

A. It says in the patent the temperature should not rise over zero degrees, and finally it is allowed to rise to about ten degrees. Well, we started, as far as I recollect, and I can find that in a minute, at eight below zero the internal temperature was never below minus eight my report shows.

MR. KNIGHT: You are speaking of centigrade, Professor?

THE WITNESS: Centigrade always. That was, I should consider not a very important modification, Colonel, a modification for safety, and then the critical question comes on which this whole thing hinges. The patent is absolutely silent in regard to the fact that we must start with pure nitro-oxyphenylarsinic acid. That is where the trouble originated, at that point, and I am quite scientifically certain in connection with these toxic preparations which led to the most serious results, results which are known to counsel. There we had to introduce what I consider essential improvements, and that is the preparation at this stage of a pure re-purified product.

It is the common experience that in manufacturing we need not stop to make perfectly pure products. We can purify the final product, and,

when an exceptional case occurs, as in this instance, a case, too, where, if that is done, the injection into the veins can lead to death, then in my scientific judgment, not as a patent chemist, but just as a chemist, and as a man, I think the patent should specify that the greatest precaution should be taken to get the pure product at this stage.

XQ. 174. Would you read to me exactly what the provision of the patent is with respect to that particular intermediate?

A. It tells you how to prepare it. I will go on from this point, line 47:

> "The nitrooxyphenylarsinic acid which crystallizes slowly from the solution may be filtered off. It forms a yellowish-white crystalline powder. This nitro-oxyphenylarsinic acid is pretty readily soluble in hot water, but difficulty soluble in cold water, readily soluble in alcohol, acetone or glacial acetic acid. Its alkaline salts, which are readily soluble in water, are of a high-yellow color; it decomposes when heated."

Then it goes on to describe how that should be used, and there is not a syllable warning the man who wants to make arsphenamine for use on the human being that he has got to purify his product at this stage and start with pure material; because later on there is no chance for purification. When we try to purify the final product, it grows worse; and I have figures on that, Colonel, on everything I state here.

XQ. 175. I am not questioning your statement. We have the distinction that you draw, first that you used a little lower temperature than that prescribed in the patent; is that right?

A. That is correct, and to purify the product.

XQ. 176. Second, you use a pure, what is the name of the drug?

A. It is an intermediate—nitrooxyphenylarsinic acid.

XQ. 177. You used a pure acid and the patent did not say a pure acid, is that the difference?

A. That is the difference, the essential difference.

XQ. 178. Later on, the patent did not specify the point at which you had to purify your products; is that the next point?

A. This is the point, and I would like an opportunity to explain to Colonel Anderson, in camera, the strength of this point, because I have facts connected,——

XQ. 179. I am perfectly willing to accept your statement, Doctor, that the result without the use of the pure acid and without purifying at the point you indicated was not satisfactory. I am not questioning that.

MR. KRESEL: Your Honor please——

MR. ANDERSON: I do not want to be insistent on the strict rules of evidence with Dr. Stieglitz, but I am at a great disadvantage in examining him anyhow because of the fact that he is dealing with a subject that he knows and I do not know. Therefore I would like to ask the witness to confine himself to answering the question.

MR. KRESEL: I do not think that the witness is now subject to any such criticism. I think he is answering.

THE COURT: Possibly it depends upon the point of view. We will let it go at that. Have you some other statement?

MR. KRESEL: Yes, your Honor. I was going to suggest that I thought, in view of the line of cross-examination, that if your Honor intended to make any limitation in your ruling yesterday as to the disclosures that this witness may make, the

time has come when such restriction should be removed.

THE COURT: Is there something you want to say, Colonel Anderson?

MR. ANDERSON: I only want to say to counsel that Dr. Stieglitz in his testimony on yesterday, in which he said that he did not wish to make a statement as to the processes employed by these manufacturers, said he was perfectly willing to state what his experience in his laboratory was; and I limited my questions specifically to his experiences in his laboratory.

MR. KRESEL: You are missing the point, Colonel. It is my fault. I have not made it plain. Professor Stieglitz has just said that he would like an opportunity to tell Colonel Anderson, in camera as he says, about the very serious results that followed. Now I say that the time has come when it is not necessary to have such disclosures made in private. I think, in view of the cross-examination, this witness should make the disclosure right here in Court.

THE COURT: The examination on each side has made it necessary for me to know what the difference in effect is upon a human being between salvarsan produced as Dr. Stieglitz says, starting with the intermediate pure, and starting with the intermediate he mentioned in a manner that a chemist skilled in the art would ordinarily start. I should want to know that. I am not concerned at this moment as to whether he gives the source of his information, but he may testify as an expert on that point if he wants.

MR. KRESEL: All I desire, your Honor, if you will grant me that, is that you make plain to the

witness that he is not restricted, that he may tell the facts.

THE COURT: Yes, with this exception. The order made yesterday was general and applied to cross-examination as well as direct examination, with this exception. If the Government should happen to want—I do not know whether it will or not—testimony from this witness on the record with respect to the secret trade processes of any of the manufacturers making the product, the Government may examine him in chambers, taking with it any Government official that it likes, without restriction, for the reason that the information that Dr. Stieglitz has is in part Government information, and so far as I know, may be disclosed to such Government officials as the Attorney General.

MR. KRESEL: I think that is quite clear.

THE COURT: So that that may be gone into, if you desire. I am not suggesting that you do or do not, but in the event it comes to trade secrets, I deem it my duty to protect trade secrets, so far as I can do so, without detriment to the Government's case or the defendant's case.

MR. KRESEL: The present question, however, does not touch trade secrets. As I understand, the witness desires to give certain information showing the effect of an application of salvarsan produced according to the patent, and salvarsan produced with the modifications and corrections that the Professor has mentioned. I understand that he thinks he has not a right to do that and therefore suggests that we go into chambers where he can divulge that information. Now I say, your Honor, that the witness should be made to understand that he may give the facts as to that.

MR. ANDERSON: May I be heard on that, sir?

THE COURT: Yes.

MR. ANDERSON: If your Honor please, I have carefully this morning, and for a purpose, limited my examination of Dr. Stieglitz to his personal knowledge gained in his laboratory. I limited it even to his knowledge as a laboratory chemist.

He stated that he had two assistants in his laboratory. In view of his statement yesterday that he was perfectly willing to give his actual laboratory experience, after a little consideration I determined to go into his experience in the laboratory. And I think Dr. Stieglitz understood that I limited my question absolutely to his laboratory experience. If your Honor will permit me just to go on, to answer counsel.

THE COURT: I will.

MR. ANDERSON: I am not at this stage asking Dr. Stieglitz anything that was done by any manufacturer of salvarsan in the United States or any man engaged in trade in the United States.

THE WITNESS: Colonel, you do not understand that I did research work in Chicago on the processes, my own research work on the processes used by these people.

MR. ANDERSON: I do not understand that, and I do not wish to ask that question. Because I understood yesterday Dr. Stieglitz said he did certain work in the manufacture of salvarsan, and it was on that information of his work, not in any way connected with these laboratories, as I understood it, that I was asking the information. If it is connected with these laboratories, as I understand my instructions I am not going to ask about it, as official information, and in the second place I am presently going to bring this second question up, to the end that I may understand exactly

what I can go to; but I am not inquiring into anything you did for the laboratories or the manufacturers of salvarsan.

THE COURT: But if I understand the situation, Colonel Anderson—well, I do not recall at the moment what your precise question was, and probably I better get that before I make any statement.

(XQ. 179 and the answer read as recorded above.)

THE COURT: I am not sure that I have the question clear yet. Can you state it, Colonel Anderson? Do you happen to recall it?

MR. KRESEL: The stenographer can read it.

(XQ. 175 to XQ. 179, with the answers, read as recorded.)

MR. ANDERSON: If your Honor please, my position is perfectly clear. I was asking Dr. Stieglitz about his personal experience. If I misunderstood Dr. Stieglitz yesterday I would like permission to turn to the record and show his answer on which I was proceeding into this inquiry.

THE COURT: I am going to let you go ahead as you desire, Colonel Anderson, but there are two questions I am going to ask unless they are asked on one side or the other, and those are the two questions I indicated awhile ago. I have no objection to asking them now or when you are through. I will ask them now so you can cross-examine with respect to them, if you wish, but I feel it is my duty to have it brought out here whether or not those persons skilled in the art in America would understand from this patent that only the intermediate pure to the extent described by Dr. Stieglitz would be understood as being called for by the patent, by any person skilled in the art in this country; and, second, the difference

in effect of the product of the patent when using a pure intermediate and one that is not pure.

MR. KRESEL: That is, the difference on a patient.

THE COURT: The difference on the patient, yes. You can consider those questions asked by me now and have them answered, or you may proceed with your cross-examination.

MR. ANDERSON: Of course, to the second question I would have no objection. To the first question, if it were asked by counsel, I would feel constrained to object.

THE COURT: I assume, Colonel Anderson, that you will not hesitate to object.

MR. ANDERSON: Subject to that condition.

THE COURT: I hope you will not hesitate to object to questions I ask; but it seems to me they are the vital points with respect to the salvarsan patent and I do not want to miss the opportunity of having this witness give me his views with respect to those two matters.

MR. ANDERSON: Will your Honor now just consider those questions asked and permit Dr. Stieglitz to answer your Honor's questions subject to objection?

THE COURT: Yes, now or when you are through.

MR. ANDERSON: Now would be a good time. I have no objection to having it done now.

THE COURT: You stated if they were asked by counsel you would have an objection. Will you state your objection?

MR. ANDERSON: On the first question, sir, I think that Dr. Stieglitz can state what he used in reply to question by counsel, he can state what the patent says and what he did, but as to whether the patent is capable of construction requiring a

certain use or not a certain use, a certain process or not a certain process, is purely a question for judicial determination in the light of those two facts, and I do not think that the question which your Honor suggests, if put by counsel, would be a legal question. Therefore I feel constrained to object.

THE COURT: If it goes to a question of construction and if that is involved, of course I would not be bound by the answer, and would have to determine that from a legal standpoint rather than from the standpoint of a person skilled in the art. You may reserve that objection. But we can cure the defect, if there is one, later if we take it; we cannot cure it if we fail to take it.

MR. ANDERSON: Subject to that objection, may I ask the stenographer to read to Dr. Stieglitz your two questions in their order, or you put them, if your Honor would prefer, of course, to the end that they may be answered now, because this is an appropriate place.

THE COURT: Do you understand the two things that I had in mind, Dr. Stieglitz?

THE WITNESS: I do, yes, sir.

THE COURT: Would you be good enough to tell us, then, at this point what the answers are to those two inquiries?

THE WITNESS: An expert chemist trying to use this patented process would find the essential lacking matter in the course of time.. How long it would take is shown by the fact that in 1918 in practice this essential fact was overlooked in material sent out to the public by——

MR. ANDERSON: One moment. If your Honor please, I feel constrained to ask that the answer be limited to a fair reply to your Honor's question. I know Dr. Stieglitz does not mean it, but I

assume he does not understand these technical rules.

MR. KRESEL: I am not waiving the right to have the evidence, but for the present I will consent that Dr. Stieglitz do not state by whom it was done.

THE COURT: Counsel, if I understand, make this suggestion, Dr. Stieglitz, that in answering those questions they prefer that you do not give me facts, but give me such information as you would have as an expert solely in replying to those questions. Can you do that?

THE WITNESS: Your Honor, there are experts and experts. I in my twenty-five years of experience saw the difficulty after trial and study, but the fact is, the experience is that—I beg your pardon. I really would like to speak freely in camera before your Honor and to counsel.

THE COURT: By shaking my head, I did not mean that. I was just thinking you are not the person meant by patent law as one skilled in the art; it is an entirely different type of person, Doctor. So if you will give me your experience and the time it required you to discover that, that may be a guide to the other matter.

THE WITNESS: It took me and my assistants about five months, your Honor, to prepare a product which passed 100 per cent. perfect.

By THE COURT:

Q. 180. What is the difference in effect upon the patient in the use of a product prepared by the use of a pure intermediate?

A. As a matter of fact, it can range all the way from a curative agent to death.

By MR. ANDERSON:

XQ. 181. Doctor, in the questions which I am now going to ask you I wish you would distinguish very

clearly between any work which you did in your laboratory for development of processes to be used by the various producers and work which you did in your laboratory of independent or experimental character for the development of the process yourself. Is there such a distinction between your work?

A. I think it was all done with the effort to help them.

XQ. 182. Yes; but was it done in testing out their processes, or was it done on your individual and independent initiative?

A. It was done on my initiative, so I would be prepared to advise them as an expert.

XQ. 183. But what you have been telling me did not come within your knowledge as a result of your acting for them or in an effort to develop their processes, but it was your independent process with a view to advising them; am I right about that? Do I make myself clear?

A. If you care to, you may have my answer stricken from the record; I only want to help you.

XQ. 184. I know you do.

A. But what I did was to use only my own acids and to secure from the manufacturers their acids, and go on to the product.

XQ. 185. Can you distinguish between the two?

A. Yes, my records distinguish between them.

XQ. 186. I mean, could you answer questions here which related only to your acids and did not involve theirs in any way?

A. Yes, I could do that.

XQ. 187. Because I want to reserve that question to take up in a different way. I do not want to go into anything that affected any of the licensees of the Federal Trade Commission, or which would disclose any of their business or their trade secrets; but I want to confine my inquiry absolutely to your own independ-

ent laboratory experience; and if you cannot answer with that limitation, then just say so and I will not press the question.

With that understanding I would ask you what was the test in 1918 prescribed by the United States Public Health Service for salvarsan?

A. In 1918, I believe it started with 50 milligrams injected into a white rat; 50 milligrams per kilo of white rat. That is the test.

XQ. 188. What was the percentage of perfection required; if you can state it that way; I do not know whether you can.

A. I really could not recall. I believe out of five white rats they allowed one or two to die, but I could not recall that.

XQ. 189. In that event, if out of five white rats two died, it would be what you might call 60 per cent. perfect, would it not?

A. The allowance, Colonel, was made in order to take into account the resistance of a white rat to toxicity.

XQ. 190. Of course, that applies to all animal life.

A. But I am not a zoologist or a bacteriologist. That was done in the Public Health Service.

XQ. 191. You stated in reply to a question of his Honor that it took you five months to produce a product 100 per cent. perfect. What I want to know is how long it took you to produce a product which would then pass the test of the United States Public Health Service?

A. Colonel, my record shows that after five months we sent out a lot to the Hygienic Laboratory for testing and they put the test as high as 120, which is, I believe, the test today, which means safety for human beings; when five rats were injected, the mortality was zero.

XQ. 192. Nil?

A. Nil.

XQ. 193. Now, at that time, the United States Public Health Service had a standard below which this stuff was not allowed to be used, had it not; it did have such a standard?

A. It did.

XQ. 194. That standard did not require 100 per cent. perfection, did it, at that time?

A. It required, as far as I can judge, that the thing should be safe for human beings.

XQ. 195. Yes.

A. But it did allow a certain percentage of loss in the white rats.

XQ. 196. Of course, I do not imagine that the Public Health Service would allow the use of a medicine which was not safe for human beings. What I am trying to get at is what was the standard, the percentage standard which they put as their standard; I understood you to say it was either one or two out of five, and you do not recall?

A. I could not answer with any definite knowledge, Colonel.

XQ. 197. All right. Now, Doctor Stieglitz, have you pointed out the distinctions between the process as employed by you in making stuff 100 per cent. perfect and the process defined in the patent to its conclusion?

A. I have not.

XQ. 198. Would you kindly do so.

A. I have merely emphasized the importance of purification at the point where the final preparation of arsphenamine takes place.

XQ. 199. Yes. Now, would you go ahead and state what, if any, other elements entered into the process which you personally employed, not the manufacturers, we are not dealing with them, as distinct from that in the patent?

A. I would like to summarize first the net result in a few words, which I am sure you would appreciate, and that was we found it necessary to exclude air in the drying of what we call the base, and we found it necessary to exclude moisture. Let me say we found it highly desirable to exclude moisture in the preparation of the so-called hydrochloride from the free base. That will summarize what we found we had to do, which is not emphasized or stated in this basic patent. Do you want the details, Colonel?

XQ. 200. No. I think as far as my knowledge of the subject goes, which is a limited knowledge, that is all I want.

THE COURT: Do you object to his stating the reasons for that, because I do not know whether that is purely a mechanical reason, concerning the impurity of the product, or whether it is a matter of practice, and if it is necessary to exclude that.

XQ. 201. You heard his Honor's statement. Would you answer his Honor's suggestion.

A. One great source of toxicity of arsphenamine is that the free base is sensitive to oxidation, and the product of oxidation is exceedingly poisonous. We have got to prevent its formation.

THE COURT: And that is the reason for excluding air?

THE WITNESS: And that is the reason for excluding air. And the second question asked by your Honor in regard to the reason for reducing the amount of moisture is that we found in the presence of water, we would get a kind of colloidal, sticky material which did not dissolve readily and might on injection cause the results introduced by solid particles.

XQ. 202. Now, the danger of oxidation of a prod-

uct of that character was a matter known to those skilled in the art, was it not?

A. It was a matter that should have been known.

XQ. 203. To all skilled in the art?

A. Yes.

XQ. 204. And also the importance of the elimination of moisture was a matter that should have been known to those skilled in the art, was it not?

A. I am not sure of that, Colonel, I think not.

XQ. 205. You found that then by actual experiment to be a desirable thing?

A. A desirable thing.

XQ. 206. Now, Doctor, you have now, as I understand, pointed out what, from your experience and your assistants of course working with you, in an independent inquiry of your own, the distinctions which you deemed necessary in the production of this product to the high degree of perfection which you have indicated, as between your process of development and that contained in the basic patent to which you refer; is that true?

A. I have given the basis for my answer, Colonel Anderson.

XQ. 207. That is the same thing in effect?

A. That is the same thing.

THE COURT: There is one other fact that I should like to know, Colonel Anderson, whenever you find it convenient, and that is this: Whether Dr. Stieglitz is familiar with the product that was imported prior to the American time of manufacture, and what its effect was upon the patient. It may indicate something to a witness of technical skill between the German and American product, or it may indicate something else, and I should like to know it.

XQ. 208. You heard his Honor's question?

A. I had occasion to examine the product. None

was sent to this country, I believe, that had not been tested. I am free, of course, to disclose the facts concerning the process abroad, am I not, your Honor?

THE COURT: My question did not call for that. I am just trying to find out the effect on human beings of the German product imported into this country prior to the war.

THE WITNESS: It certainly was a fine curative agent. It was a great discovery, of the greatest benefit to humanity.

By THE COURT:

Q. 209. I am speaking particularly with regard to the degree of toxicity?

A. The product was a safe one to use.

By MR. KNIGHT:

Q. 209-a. Would you describe it as 100 per cent. in that sense?

A. No, I think that our present American product is better and cheaper than the European product of that time. I have every reason to believe that the European product was not made at that time by this process.

MR. ANDERSON: Hold on——

THE WITNESS: You can strike it out, Colonel Anderson.

MR. ANDERSON: I move to strike that out. Hold on, Doctor.

THE COURT: You may strike it out. I assume you would not want that on cross-examination.

MR. ANDERSON: No, I would not want it on cross-examination, and it is necessarily hearsay. There are two reasons for the objection offered to it.

THE COURT: We will strike it out now.

THE WITNESS: Sorry, Colonel.

THE COURT: You can go on now.

By MR. ANDERSON:

XQ. 210. Now, Doctor, I will ask you a question which I will ask you to answer as briefly as you can. Take the patent referred to, No. 986,148, and state the process set forth in the patent in detail, what is done under that patent and what you did; and also state the exact process employed by each of the licenses of the Federal Trade Commission and its variation from the process defined in the patent, without disclosing information which came to you officially as the representative of the Federal Trade Commission and Public Health Service which you indicated yesterday. Can you do that without disclosing official information?

A. I could not answer the second part of the question.

XQ. 211. Of course the second part would be necessarily the part referred to?

A. Yes. I could not.

XQ. 212. You could not do that without disclosing official information coming to you as representative of the Federal Trade Commission in the capacity which you indicated yesterday, and the Public Health Service?

THE COURT: With respect to which he is at least under the order made yesterday in response to Colonel Anderson; but if he is going to deal with trade secrets or trade processes——

MR. ANDERSON: I will ask another question on that, your Honor, so as to bring that question out, and I wish to state in response to your Honor's statement that as I understand my instructions from the Department they are——

THE COURT: Colonel Anderson, I am not concerned with your instructions. We are trying this case here, and I am looking to you as the United States of America and nobody else.

MR. ANDERSON: I merely want to make that statement so that your Honor will understand that I will not go into cross-examination of the witness on any points that call for the disclosure of official information in the manner stated—put it that way.

XQ. 213. I will ask you this question: Can you take the patents and vary the process down and give me information as to the process employed in each of the plants you inspected, or by the producers with whom you talked, and point out the difference between the process as set forth in the patent and the process as used by each of said manufacturers in detail, without disclosing the trade secrets of those trade processes?

A. It involves disclosure.

XQ. 214. Of their trade secrets?

A. Yes.

MR. ANDERSON: Then under your Honor's ruling, I shall not ask any question on that subject, because I do not wish in any way to transgress that ruling.

MR. KRESEL: I understand, however, your Honor's ruling to be, that counsel, if he so desires, may have that information in chambers in the presence of your Honor and in the presence of counsel for the defendant.

THE COURT: In the presence of counsel for the defendants and such persons as Colonel Anderson in his unlimited discretion may see fit to take with him, and, of course, in your presence, as representing the defendants.

MR. KRESEL: Yes, sir.

MR. ANDERSON: But subject to the limitation of confidence which your Honor imposed yesterday.

MR. KRESEL: Not yesterday.

THE COURT: I do not understand, Colonel Anderson, I do not know what you mean.

MR. ANDERSON: Subject to the limitation of confidence and non-disclosure which your Honor imposed.

THE COURT: So far as this is concerned.

MR. ANDERSON: I understand. I only want to get it straight.

THE COURT: The evidence within the knowledge of this witness is Government knowledge. Of the use the Government shall make of it, apart from the trial of this case, is the Government's concern and not mine. So far as this case is concerned, it will be printed, but it will not go into the general public record, but into a supplemental record which would be open only to counsel. If you wanted to meet that by rebuttal testimony, I take it that you could do that without disclosing the trade secrets or trade processes in open court. If not, we could take that in chambers. In other words, that secret is a Government secret, and so far as this Court is concerned, I would give you full opportunity to use it to full advantage in this case without any unnecessary public disclosure; but there will be no restriction upon any person, or subsequent action of Colonel Anderson or his colleagues or experts, than the Executive Department of the Government which is to place thereon, because I should place none, say in the prosecution of this case.

MR. ANDERSON: It is about time for your Honor's morning short recess. I would like to talk to Mr. Knight. May your Honor indulge me. I ask this question—does that apply only to this witness? Probably that is not a fair question because you will deal with the others as they come up.

THE COURT: You mean whether that applies to a person who is not in the position of some of the Government officers. Do you mean whether that applies to Dr. Volwiler?

MR. ANDERSON: I mean whether it applies to a witness whom your Honor did not regard as having secrets in charge of the Government.

THE COURT: Let us consider that. Let us take Dr. Volwiler as an instance. You mean a person like that?

MR. ANDERSON: Yes.

THE COURT: No, because I think there is this difference, Colonel Anderson, in the case, although I may be wrong. Here is information which is open to the Government, well, we will say to the Attorney General and to any person that he may want to have it made known to. You stand for him. How widely he makes that public in any way or at any time other than in this case is no concern of mine. So far as this case is concerned, I will keep it as secret as possible from everybody save the Government representative and Mr. Kresel as could possibly be done in a practical way.

Now, then, so far as Dr. Volwiler is concerned, taking him merely as an instance of a class, that information is not within the knowledge of the Government, so far as I know. Consequently, the restraint with respect to secrecy that I would impose upon Mr. Kresel in the examination of Dr. Stieglitz would be imposed on both sides in the case of a person coming within the class of Dr. Volwiler.

There is no limitation upon you in the use of this information in any way whatsoever, except that it must be kept as secret as possible in this case and the injunction with respect to secrecy

with respect to this testimony would be imposed only on Mr. Kresel and not on you at all.

MR. KNIGHT: May we have a few minutes to confer, your Honor?

THE COURT: Yes. But you understand, Colonel Anderson, that in no case would you be deprived of a right to rebuttal taken in chambers or here, as the necessities of the case might require. We will take a short recess.

(A short recess was taken at this point by direction of the Court.)

MR. ANDERSON: May it please the Court, I find myself in quite an embarrassing position. I wish to state the conclusions which I reached hurriedly during the short recess with the advice of my associates. We may be wrong, but as at present advised my view of the law is that the information obtained by the Federal Trade Commission representatives and possibly by the Public Health Service is information that cannot be disclosed to either officers or employees of the Government without an order of the Court.

The Federal Trade Commission, in our view, would have the right to refuse to disclose information to the Attorney General himself without an order of the Court. The privilege attached to that information is not a privilege of the Government, but is a privilege given to those who disclose that confidential information to the agencies of the Government, and are so required to do by law to the end that the Government may function and thus to promote the free administration of Government agencies.

Therefore, our view is that the Government not only has no right to this information, speaking

of other than the one agency defined by Congress, unless exigencies of justice required that they go into court and ask for it, and the court granted the request, from which there would be a review, but that it not being a privilege of the Government, an officer of the Government cannot waive the privilege, and, therefore, that an officer of the Government, or a person like myself representing the Government temporarily in a legal capacity, would not have the right to ask that that information be disclosed which might in its ultimate result prove not only prejudical to those persons who are required to report to the Government, but in addition thereto might prove prejudical to the agency of the Government created by act of Congress.

Perhaps I am stating my views crudely, and I hope your Honor will understand that I am stating them on impulse, almost; rather by intuition than by thought. That being the case, I should not feel justified in asking for the disclosure of the information in question of an official character without at least definite instructions from my superiors. I feel that it may be of very far-reaching consequence in the administration of several branches of the Government of a most important character, involving questions which I have never had a chance to consider or to take the instructions of my superiors upon, except in the most general way.

Therefore, I feel it is my duty, and in that my associates concur, to resolve any doubts which I may have, in the exigencies of this case, in favor of the general public interest of those agencies, for the present at least, until I can give the matter further consideration and also receive definite instructions.

I hope your Honor will understand the condi-

tions under which I have to reach that conclusion. It may be a wrong conclusion. I am going to give it very serious consideration, and if it is a wrong conclusion and if it seems to me that we can take this evidence in a way which will not be prejudical to those agencies, both of which have cautioned me directly on the subject, or if I can get instructions from my superiors, I will undertake to do whatever is desired. In doing that, I desire to express my appreciation of your Honor's courtesy in broadening the situation along the lines which you have indicated.

THE COURT: It is not courtesy, Colonel Anderson. Counsel have a certain opportunity to consider matters involved in a case which come up. A judge has no such opportunity.

MR. ANDERSON: I understand that.

THE COURT: He must reach an immediate decision. I appreciate full well the line of reasoning which brings you to that result. But I do not want to be left by your remarks in the position of being less careful of the Government's interest than counsel. It is of the utmost importance that the interest to which you directed your remarks be protected and conserved. It is likewise of great importance, though possibly not so great, that the interests of individuals and the secrets of individuals, which these are, should be guarded.

Possibly the scope of my ruling was not fully made clear. It is this: Under the order made yesterday this witness is directed to answer any questions which may be put to him by counsel on either side of this case. If those questions call for a disclosure of facts which he got in his governmental capacity, then we would take those in chambers under such protected measures as would prevent any further public disclosure in connec-

tion with their taking than was absolutely necessary.

Now, I say that guard of secrecy does not apply to you in such case, or to such associates that you want to bring in. Why? Because you are in the Government service, and I assume that it would not take a judicial order to prevent you or those invited by you from making any improper use of that matter.

If this were knowledge or if the information which Professor Stieglitz has came to him purely in his capacity as a scientist, then I would feel it my duty, notwithstanding my full confidence that you would not make a disclosure, to put that requirement upon you, as I do upon Mr. Kresel, with respect to the facts that may be disclosed by him in that situation. I have not any lack of confidence in him, but I deem it my duty to do it. Whether you would make any use of them outside this case would be a matter that rests with you, and in taking them we would take them under such protective measures as would prevent any greater disclosure than is necessary in the administration of justice.

MR. ANDERSON: I think I understand your Honor's position, and I can quite appreciate the situation. Therefore, I am not going to pursue that inquiry further at this time, I am going to take up another line of inquiry. It may be I will ask Dr. Stieglitz to stay over until this afternoon, until I have a little further time for consideration at luncheon and possibly communicate with those to whom I report.

XQ. 215. Dr. Stieglitz, on yesterday, counsel for the defendant produced and handed to you for identification certain letters between yourself and Mr. H. A. Metz, beginning with June 21, 1918, and ending with

January 7, 1919. You recall those letters, do you not?

A. I do.

XQ. 216. I note on the originals of those letters a number of paragraphs bracketed and underscored in pencil. Did you underscore those?

A. I did that.

XQ. 217. When did you first give those letters to The Chemical Foundation or its counsel?

THE COURT: You need not answer that, unless you want to.

MR. ANDERSON: None of these questions you need answer, unless you desire, Dr. Stieglitz.

THE COURT: I do not know about any other but this question. He has the personal privilege.

MR. ANDERSON: I intended saying so, but I overlooked it. I am much obliged to your Honor for calling it to my attention.

XQ. 218. Are you willing to say when you first delivered those to counsel or to The Chemical Foundation?

A. I do not know whether I should or not. I must get counsel on that.

MR. KRESEL: I have no objection.

THE COURT: That is not counsel's privilege. It is the witness's own privilege as to whether he wants to say when he delivered them. You may confer with counsel if you want to.

XQ. 219. Would you desire to confer with counsel?

A. I only want to know, Colonel Anderson, whether in my lack of understanding of legal methods, my answer might lead me into legal trouble.

XQ. 220. Well, I would not want to get you into any legal trouble. I want to get the facts, but I would resolve all doubts on that subject—I hope you won't think I want to embarrass you. I do not. I feel it

necessary to ask you these questions, if you are willing to answer them.

THE COURT: The question asked by you of Colonel Anderson I can answer in the affirmative, that that is the basis upon which I suggest to you that you need not answer.

THE WITNESS: This is a warning to me?

THE COURT: The question indicates my reason for making the suggestion to you. You can waive it.

MR. ANDERSON: The Court has very kindly stated to you, Dr. Stieglitz, much better than I could, and I would be very glad to state to you that it is a question that I would not want you to answer if you fear it would get you into any legal complications. I merely wanted to ask a question.

MR. KRESEL: I do not think it is necessary to make the suggestions to Dr. Stieglitz.

MR. ANDERSON: He asked me a question and I tried to answer it.

MR. KRESEL: I think Dr. Stieglitz is at perfect liberty to answer the question. If he asked my advice about it, that would be my advice.

THE WITNESS: I handed those letters to counsel Wednesday of this week.

XQ. 221. Had you ever before that showed them to The Chemical Foundation?

THE COURT: What is the relevancy of that question, Colonel Anderson?

MR. ANDERSON: Its relevancy is this, sir: If Dr. Stieglitz has by conference, or by handing this correspondence to counsel for the defendant, disclosed or published, in a sense, to that limited degree, the information which is here involved, why, it might change the whole position of the Government as to the taking of this testimony, and there-

fore, it is a foundation for us to ask for a ruling of the Court, which we cannot ask without knowing those facts.

THE COURT: I do not understand you.

MR. ANDERSON: In other words, it is no longer privilege that Dr. Stieglitz is disclosing.

MR. KRESEL: Who claims it is privilege? You were the one that claimed the privilege.

THE COURT: I have said that all bars put up by the Federal Trade Commission statute which I am at liberty to let down in the interests of justice have been let down, and that you are at liberty to ask Dr. Stieglitz any questions which you desire pertaining to those matters; and it is no longer a question of privilege except such privilege as I deem, in the performance of my duty, to be really necessary to prevent the secret trade processes of the several manufacturers who conferred with Dr. Stieglitz from becoming public property. I do not exactly understand the last question.

MR. ANDERSON: Let me suggest the thought that was in my mind, and possibly your Honor will see.

THE COURT: Yes.

MR. ANDERSON: The position of the Government, and I wish to take advice on the subject, might be entirely different if this information as to these processes of these manufacturers were known to the defendant here, to its counsel and its officers. That might present an entirely different question from a question of the matter being known solely to the distinguished witness now upon the stand, and therefore I wish to know just what was the status of this information, to the end that the Government may either follow such course under your Honor's present rulings

as it may think its duty to follow, or ask for some modification thereon with a knowledge of these facts. Certainly my position as to this information might be very materially changed if it were known to the defendant and the persons connected with the defendant, in the sense that it was public information. That is the thought in my mind, and I desire to give facts about that, if I can do so without undue embarrassment to the witness.

THE WITNESS: Colonel, may I say——

MR. KRESEL: It is not a question of embarrassment at all.

THE COURT: Dr. Stieglitz wants to make a remark. Will you wait for him?

MR. KRESEL: Yes, your Honor.

THE WITNESS: I received information, Colonel Anderson, that Mr. Metz had used my name and expressed my wishes. I had no information about that, and in order to be in a position to support my interpretation, those letters were secured by me from my own files and I consulted with counsel in regard to their content. So far as I know, only the counsel has seen it; no one else of The Chemical Foundation.

THE COURT: I will hear you, Mr. Kresel.

MR. KRESEL: I must confess, your Honor, that I do not see how the Government's position in this matter can be affected by the question as to whether we know or do not know the facts. The Government must decide the question for itself. They either want this information that the witness had, and, as your Honor has ruled, the Government may have it, or they do not want it. Up to the present time they say they do not want it. Now, what can be the materiality as to when or to whom these letters were shown? The witness

has already answered the question; but what is the use of going on with it.

MR. ANDERSON: I have nothing to add, sir. I have stated my position.

MR. KRESEL: Is there a question pending?

THE COURT: There is an unusual situation confronting me, Colonel Anderson.

MR. ANDERSON: I recognize it and do not want to embarrass you on it.

THE COURT: And we might as well face it now. The Government of the United States is the party plaintiff here, and you have in a very broadminded way said that the Government of the United States wants a full disclosure of the facts. The Government of the United States, I assume, would not want to put before me for use in determining the issues of this case, backed by its guarantee, testimony which could be impeached, if not flatly contradicted, by other evidence which was available to the Government of the United States or some of its agencies, and keep such other evidence away from you. I assume that of necessity must be your position, Colonel Anderson.

MR. ANDERSON: I should think your Honor would assume that to be my position. I would not think that any court in which I have ever appeared would question it, and I do not think this court would.

THE COURT: What prompted my question was the fact that I had stated so many assumptions on which I thought there would be no difference between us, and I found that we did differ. Consequently, Colonel Anderson, the situation seems to me to be this: there are none of these questions that you have asked that would have any effect,

at least on my mind, so far as affecting the weight to be given the testimony of this witness. However, I will let you ask him, for such effect as may be given to that testimony. I do not think I need go further. Unless that is the purpose, I fail to see the purpose, Colonel Anderson.

MR. ANDERSON: I have undertaken to state to your Honor the general thought that is in my mind in asking these questions.

THE COURT: Yes, but that is not in issue. If you want to ask Dr. Stieglitz any questions privately, I will make my order heretofore entered in this case extend to any questions that you may ask him as fully as if he had been brought here as your witness, reserving to him the right to refuse to answer in any case in which he deems it proper to do so; so that you may have full opportunity to determine from him privately as to whether you want to go on. The only relevancy that I can see that this question would have would be that which I have mentioned, and you may take it for that purpose, if you want to, reserving to the witness the right to withhold his answer.

(XQ. 221 repeated as above recorded.)

A. No.

XQ. 222. I thought you did answer that, did you not, Doctor?

A. My last answer was that I showed them Wednesday, was it not?

By THE COURT:

Q. 223. Then you gave an answer just now to the question that was read. You said your answer to that was "no"?

A. The question was, before Wednesday had I shown them to The Chemical Foundation.

By Mr. Anderson:

XQ. 224. Of course, that includes its officers and agents? Of course, The Chemical Foundation acts through its officers and agents?

A. On Wednesday I showed the letters to Mr. Kresel in connection with the use of my name in the testimony of Mr. Metz.

By Mr. Kresel:

XQ. 225. The question is, whether you ever before showed them to anybody else connected with The Chemical Foundation?

A. And the answer is "no".

Mr. Anderson: I was just thinking, your Honor, whether I want to ask him any more questions.

The Court: I do not want to hurry you at this point, Colonel Anderson. You may take such time as you may deem necessary.

By Mr. Anderson:

XQ. 226. I shall ask you one other question, which you need not answer unless you wish to, and please do not answer until his Honor has had a chance to rule on it: Have you at any time in your discussion with the officers of The Chemical Foundation, or its agents, disclosed to them the processes employed by the several manufacturers of salvarsan under Federal Trade Commission licenses in the manufacture of that drug?

The Court: You need not answer that unless you so desire, Dr. Stieglitz. The statements made by me with respect to the preceding question will be considered as having been made to this question. May I ask you this: Are there any other agencies of the United States which may have information with respect to the matters involved in this suit, disclosing evidence one way or another?

Mr. Anderson: Not that I know of, sir: The

only information that I had, for instance, in this suit was the records of the Federal Trade Commission brought here under subpœna of the Court, and it was explained that they were brought under subpœna of the Court by subpœna *duces tecum*, which the statute provides for. I have never myself talked with any officer of the United States about this matter whose office is under limitation. And so, as I do not know what any member of the Department of Justice has done, we requested the other day from the State Department certain correspondence which was requested by counsel on the other side, but which I think had been examined by the Department of Justice previous to that—some of it—and the Secretary wrote a personal letter to the Attorney General, declining for public reasons to permit the production of certain of the correspondence, and sending us the remainder. So far as I can now recall, with the exception of the examination of the records of the Departments of War and Navy, which are not under the ban of secrecy, and to which both sides have had access, as I understand, that is the extent of the information of the Government.

THE COURT: No; but I am laboring under much difficulty, Colonel Anderson, and I am asking this only for my personal guidance.

MR. ANDERSON: I would be glad to answer any questions I can, sir.

THE COURT: You did produce testimony that the salvarsan patent was worth $1,000,000, did you not?

MR. ANDERSON: I think I produced that evidence, but that was entirely outside of the records of the Government. I did not produce any Government officer to testify on salvarsan, and I produced no evidence of the Federal Trade Com-

mission or the Tariff Commission bearing upon either.

MR. KRESEL: May I suggest that Dr. McCoy, who is at the head of the Department of the United States Public Health Service, who knows everything that this witness knows upon this subject, is at the command of the Government, and is now in the Government employ; nobody is keeping this thing from the Government except the Government itself. Dr. Stieglitz is perfectly willing to testify if the Government desires the information.

THE COURT: It is a highly unusual situation, and I am not going into it any further now. If I have to, I will. You need not answer unless you want to.

MR. KRESEL: I have no objection to the Doctor answering it.

THE COURT: It is not from your standpoint. It is from the standpoint of personal privilege.

THE WITNESS: I must confess I am confused.

XQ. 227. I beg your pardon.

A. I must confess I am confused as to right and wrong. I came here to help what I considered the fundamental need of the nation.

XQ. 228. Doctor, I do not ask you now to decide that question if you do not want to. I am perfectly willing for the question to stand until after lunch and then let you decide whether you wish to answer it at that time.

THE COURT: I am not trying to supplant my judgment for yours, Colonel Anderson, but I am surprised. I have nothing further to say. You can put another question.

MR. ANDERSON: I have no further questions, I think, sir. I think that concludes my examination of the witness. I am perfectly willing for

the witness to wait until later and decide whether he desires to answer that question or not. It may be that after consultation with my associates I may decide to withdraw it, but for the present, suppose we drop it there, and just let the question stand unanswered.

MR. KRESEL: Were you going to say something?

MR. ANDERSON: It may be that I will withdraw the question later if I can meet the situation in some other way.

MR. KRESEL: All right. Is that all you want from this witness?

MR. ANDERSON: I think that is all I will ask the witness for the present. Mr. Knight, do you think of anything?

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 229. Professor Stieglitz, I have two questions that I want to ask you, and in answering this question please bear in mind I am not asking you for the name of the manufacturer. Do you know of any manufacturer whose plant you visited who was making arsphenamine, who, for a long period of time tried to make arsphenamine and did not succeed because he did not start with the pure ingredient that you have described?

MR. ANDERSON: One moment. I object to that question both because of the fact that it calls for additional information of the witness, and for the further fact that it is not re-direct, and for the further fact that it calls for the reason, and therefore necessarily opens up the investigation of the process.

MR. KRESEL: Which I am perfectly willing to open up.

MR. ANDERSON: One——

THE COURT: Suppose that information would disclose and demonstrate the complete invalidity of this patent. I assume that you cannot say to me that it may not disclose such result. I am speaking now with respect to your objection based upon the Statute. Are you not then putting me or some one else in the position that the Government of the United States is asking the Court to say that certain persons were in a conspiracy, for their financial gain, to deprive the United States of certain assets, but notwithstanding the Statute of the United States authorizes a Court to remove the bar of secrecy where it is necessary to do so, and notwithstanding the charges pressed against these individuals, the United States is asking that information within the possession of certain of its agencies be withheld, although such information, if disclosed, might be sufficient to discharge them from the charge made against them in the bill of complaint. There is the difficulty as I see it.

MR. ANDERSON: I will venture to answer your Honor's question in several replies that occur to me offhand. The first is that it does not appear, and I do not think can be made to appear, that the information now sought to be elicited from this witness was known to The Chemical Foundation or to the persons who dealt with that matter at that time. Therefore, it could not affect that.

THE COURT: Colonel Anderson, my question——

MR. ANDERSON: I am now coming to your question, sir.

THE COURT: Yes.

MR. ANDERSON: Second, the fact that one of these manufacturers may have had difficulty in

the manufacture of the process because he did not use one of these intermediates that was pure, assuming that to be a fact, could not in the slightest bit invalidate the patent, as I see it.

THE COURT: You are going to answer my question, are you not?

MR. ANDERSON: I am trying to answer it. But that was the first part of your question.

THE COURT: No, Colonel Anderson, it did not deal with relevancy. I dealt solely with your objection based upon the Federal Trade Commission Act.

MR. ANDERSON: Let me say as I understand my instructions, they are to object to the disclosure of any information of a confidential character, either from the Federal Trade Commission or Tariff Commission. I know your Honor is not interested in my instructions, but I have to do the best I can.

THE COURT: But, Colonel Anderson, you leave me in this position. I may as well be frank about it, because I am going to deal with it now or hereafter, or both. I have no objection to your telling me your instructions. I do not care how the facts fall or where they fall. I am sitting in a neutral position; that is where I propose to sit and will continue to sit. But I must take into consideration in this case whether the United States had available to it at the time it filed this bill of complaint and has at the time of the trial of this case evidence which, if produced, would tend to disprove the allegations and charges made in this bill of complaint and whether it attempted to prevent the disclosure of those facts in this case, although they were in the possession of an agency of the United States, and might disprove the

charges made against the defendant in this bill of complaint.

The situation is very unusual, Colonel Anderson, and I do not want you to put yourself in that position without being conscious of my immediate reaction to that position.

MR. ANDERSON: I certainly do not wish to put myself in any position your Honor could in any sense criticize. I have tried to avoid that in a great many delicate situations in this case.

THE COURT: That is for you to determine, Colonel Anderson. You need not explain it; I am not asking for an explanation.

MR. KNIGHT: May I suggest something to your Honor?

THE COURT: I am glad to hear you, Mr. Knight, because your mind is fresher on it than mine.

MR. KNIGHT: I do not pretend to know much about this branch of the subject, being a mere patent lawyer. But the Government is hampered by the law as well as others, and the question is whether this is the right way to get these facts into the record. Make the assumption that your Honor has made, that it is evidence to prove the invalidity of these patents and that that can be proved. Is it proper under the state of the law to prove it by this witness?

THE COURT: I have no difficulty about that, Mr. Knight. Mr. Anderson made his objection on several grounds, one of which was the bar of the Federal Trade Commission statute. I had not dealt with the others because I think we can dispose of those without any great difficulty. But, as you see, one of his objections was this Federal Trade Commission act, which does to my mind present the difficulties which I have at this time

disclosed fully to Colonel Anderson rather than reserving them and spread them at large in my opinion if I have to.

Mr. Knight: My point is right on that, your Honor. Whatever be your Honor's authority, and it seems to me plenary under the act, the Government nevertheless must not, it seems to me, under the terms of the act, considering the various laws which are enacted for the purpose of encouraging the Government in the accumulation of evidence, and of the giving of information, and of the assistance of various non-Government agencies, considering the things which have tended to accumulate in the Government, the immense amount of secret information and knowledge all of us who are associated with the Government come across from time to time, and considering the reluctance on the part of various private citizens and companies in giving up this information to the Government, even for that purpose, and considering how much that hampers the Government's progress, it would be considerably more interfered with if it were felt that the Government itself co-operated in the disclosure of these things.

So that I think the Government is under considerably more necessity for diffidence, reticence and perhaps I might even say obstruction to the disclosure by its officers and employees of this sort of thing than would be the case with private companies. So that even in a case like this, where it might concern the disclosure by a Government witness who is under peculiar governmental restriction, it seems to me, he cannot be released by the Attorney General or anyone else, but only by your Honor.

The Court: Which has been done.

Mr. Knight: Which has been done. But it

does not, it seems to me, release the Executive from the necessity for his not joining in that application of releasing. Now, this information can be obtained, it seems to me, with all respect, from other sources than from this witness.

THE COURT: That brings up another matter. But the specific objection of Colonel Anderson, to which we have been directing our attention, seemed to me made it necessary for me, in fairness, to bring out at the same time some of the difficulties that I am having. The reason that I directed a conference between counsel for the parties and the witness yesterday was in the hope that some of these questions which are now being presented might be avoided, from a practical standpoint. That is patent. I did not say so because I did not want to make the suggestion, as I thought it was most patent. But here is this difficulty and I am suggesting it for no other reason than to find a way out. That is all.

If the United States has in its possession information of one sort, for instance, that produced by Mr. Metz from the witness stand here, and it has documentary evidence in its possession and available to it flatly contradicting such testimony, and it elects to proceed on the oral testimony and not only refuses to take into consideration in the preparation of its bill and the filing of its bill and the prosecution of its case, the documentary evidence in conflict therewith, but when the time comes for the production of such testimony raises the objection that the Federal Trade Commission statute prohibits it, notwithstanding the fact that the bars have been by a special order of the Court let down, it mystifies me. I will hear you, Mr. Kresel.

MR. KRESEL: I am sorry, your Honor, to take

up any time at all. But your Honor has seen the difficulty that the defendant is under. We are charged with conspiracy. The Government has access to information to disprove that charge. The Government does not bring the information into court; and when the defendant finds the information, the Government comes here and pleads that a statute prevents the disclosure of the information; and then, when your Honor relieves them by your order of any obstacle that there might be in that statute—and I say there is none without even an order of the Court—they still try to keep closed the source of information and insist upon asking your Honor to convict these people of conspiracy. Yet they come into this court and say that they want all the facts to come out. Consistency! I do not believe they know the definition of the word.

We are entitled to that information, and if your Honor will permit it, we propose to have it. And if the Government does not want it, if they do not want to ask for it, we will ask for it. The question that is now pending is directed to that proposition.

I am asking this gentleman, without mentioning any name, to state whether he knows of his own knowledge that a manufacturer tried for two years to manufacture this product and could not because he did not know what Professor Stieglitz found out in his investigation: that you had to start with a perfectly pure intermediate or you made a poison instead of a medicine. I am entitled to that information.

Moreover, I propose to go on and ask this witness to state, your Honor having said that he may, the information that he had. I am going to ask him who the man was whose product it was

that poisoned our soldiers. I want this Court and the public to know that the Government of the United States is standing behind Herman A. Metz and shielding him in not wanting it disclosed that it was his salvarsan that killed our soldiers. And at the proper time, I shall inquire what the motive of the Government is in taking that position.

I think the time has come, your Honor, when we must understand what the Government is here for. When I opened this case, I said that there was an invisible plaintiff here; and the actions of the Government yesterday and today have proved it beyond a doubt if anything has ever been proved in a court of law.

Colonel Anderson is a gentleman and I admire him. But the time has come, your Honor, when simply saying that "I want all the facts to come out," if contradicted by the act, must be recognized. We must call a spade a spade in court or out of court and the time has come when there must be an understanding here.

For six weeks we have been battling here. For what? For the Germans! They put a German expert on, imported from Germany, and then they put Metz on—imported from where? The same source! The man that fought the German battle from the beginning to the end before we went into the war and while we were in the war. It is upon his testimony that they ask your Honor to convict these men. But they are not going to keep me from showing the facts. Now, press my question.

MR. ANDERSON: Will your Honor permit me to reply to this statement?

THE COURT: Yes.

MR. ANDERSON: In so far as the question is

concerned, the Government made the objection it has made and which I felt was required by law to make. I may be mistaken. I make a great many mistakes. I do not think I could add anything to what I have already tried to say as to my reasons for that.

But as to the other part of the remarks of counsel, since our remarks are being made a part of the record, I do not think I could, in justice to the Government which I represent or myself, allow them to pass without just a very brief reply.

The Government of the United States, as I understand it, brought this suit to assert the rights of the people of the United States and to discharge its public duty under the Constitution and laws of the United States.

As I have frequently said, the Germans have nothing to do with it so far as I know or so far as I am concerned, and have had nothing to do with it.

I should hate to feel that the Government of the United States could be used for any purpose to serve the people of another country except to the extent that its duty under international comity requires. I shall not discuss that question. There are certain questions which are not debatable, either in courts or out of courts.

Since Mr. Metz's name has been mentioned, I wish to say that I never saw Mr. Metz until two days before he testified—never knew him, never spoke to him. He was supposed to have important information, or valuable information as to the value of these patents, and he was called solely on that ground. The remainder of the examination, and the remainder of the subjects gone into, were purely on cross-examination.

In any legitimate way that a witness called

by the Government could be impeached certainly I should be the last, representing the Government of the United States, or anyone else, to question every legitimate piece of evidence to that end, because that is what the courts are for, to get at the facts, and the weight of the testimony is affected by anything that conflicts with either the witness or the weight. So far as Dr. Holdermann being called is concerned, I should regret ever to learn that the courts of the United States had reached the point that it would not be proper and legitimate to call as a witness in those courts a citizen of any country with which we were at peace, giving to his evidence such weight and consideration as the character of the witness and the extent of his interests and other considerations, his nationality, if you please, and everything else, which might bear upon it, might be entitled to.

As to Mr. Metz, as a witness, he is a citizen of the United States. He was born in the United States; has been in public as well as private service. Is a successful business man. Was in the uniform of the United States during the war, and, I presume, discharged his duty. If by proper evidence the value of his testimony can be in any way affected or impeached, it is entirely legitimate to do so. I would not have called Mr. Metz as a witness if I had not believed that his testimony would be that which could be relied upon; and while on cross-examination, which was certainly conducted with great rigor, there were at times, confusions in his testimony, as to immaterial points on which he was not called; so far as I can now recall it, I do not think it has been seriously affected, but that would be a question purely for the Court and not for me.

THE COURT: You do not think the letters yesterday affect it?

MR. ANDERSON: I do not, sir. I do not think they are inconsistent with his statement, as I recall it. If I come to examine his evidence, I might find there are slight inconsistencies in these letters, confusions of statements in his evidence, but if I find there was a direct conflict, I would admit that his evidence in so far as contradicted by his letters, was certainly not a basis for the consideration of the Court. I have not examined his evidence in connection with the letters.

THE COURT: I am going to ask you after the noon recess, and I will not stop to discuss it now. I will take a recess and I will finish that after you have finished your point.

MR. ANDERSON: Now there has been something said about the "invisible plaintiff" and the position of the Government. The position of the Government in this case was stated fully in my opening statement. I adhere to every word that I spoke, so far as I can now recall it in that opening statement. I would not be here representing the Government, which is a mere temporary service on my part—did I not believe, and in fact, did I not know, that the Government was undertaking to enforce rights which it seriously believed to be the rights of the people of the United States; and in so far as there is an "invisible plaintiff"—the only one that has been mentioned was Mr. Metz—I do not think that Mr. Metz knew this suit was going to be brought before it was brought, certainly so far as I know, he did not, because it was not known, except among very few people; and as to anyone else, if there is anyone else that knew anything about it, except the duly accredited officers of the United States, I have never

been so informed, and do not so believe. Therefore, the position of the Government is, I think, perfectly clear upon the record. As to its motives and purposes, and I do not think I could discuss them since this proceeding is taken by direction of the Chief Executive of the nation.

I can discuss my own motives and purposes, but I do not think that is necessary.

Now, in so far as the objection taken to the particular evidence is concerned, I may be mistaken as to my duties in the matter—I often am; but I have acted in a condition of some embarrassment and some confusion, I will confess, for the last two days. I have been greatly confused by this conflict of laws and demands upon me, that I should protect certain confidential relationships of these institutions. I have been brought into a condition of some mental confusion, I will confess it; and I do not think anybody could pass through the last two days without being in a position of confusion. Others may be more fortunate. But I am trying to discharge my duty here in a manner in keeping with what I conceive to be the character of my client—and that is the Government of the United States. I have represented it in other capacities and I have always regarded it as the highest possible service that I can render. I shall continue to render that service in that spirit.

THE COURT: Let me add: My difficulty still remains and I hope that you and your colleagues will consider with respect to it, and I think I need not repeat it, and I hope that you will confer during the noon recess. If there is any difficulty in understanding the matter to which I am now directing your attention, I shall be very glad to discuss it with you: but I prefer to discuss it in

chambers with both sides present, rather than to go further into it here, because it is a matter with which I am officially confronted. It is a matter which lies at the threshold of the charge of conspiracy in this case. It may lie at the threshold of all questions in this case, because if the evidence—without indicating in the slightest degree what the evidence will warrant, because I shall attempt to reach no conclusion about it until it is all in—and I am going to permit the taking of the testimony of this witness on all facts that he knows, howsoever, and to get them officially or unofficially, and they will be given from this stand, except such as would be injurious to persons engaged in business, if publicly disclosed, and I shall ask that that be privately disclosed, because I can do that without doing any injustice to the United States, in asking for private disclosure, rather than public disclosure; but in the event that testimony should be elicited and explained from this witness stand, and the testimony should be sufficient to establish—whether it will or not I do not know and I am not now concerned—but should it be sufficient to establish what was established in the Rohm et al v. Martin Dennis case, 263, Fed., decided in the Court of Appeals in this circuit, in which there was insufficient disclosure so as to make the patent worthless—if that should be established as to the salvarsan patent and other patents, then there is not only no question of conspiracy left, but there is then no question, as I now see it, of power, unless it be the technical question of whether the omission of the words "as Assistant Secretary of State of the United States," after the words, "Frank L. Polk" in the Order of December 3d, prevented or made the execution of the power—not the power,

but its execution—invalid. There is where it seems to me that we are at a critical point in this case from several aspects. If you desire a longer recess than usual, you may have one.

MR. ANDERSON: The usual time is an hour and a half.

THE COURT: An hour and a quarter, and I will make it an hour and a half if desired.

MR. ANDERSON: I think the usual recess will be all that I should desire, sir.

THE COURT: At 1:15, standard time.

AFTER RECESS.

MR. ANDERSON: May it please the Court, counsel for the Government, having had an opportunity to confer during the recess, desire to state that they feel that having brought to the attention of the Court the statutes in question in discussion this morning and made the formal objections by leave of the Court in the matter of testimony as to official knowledge, they have discharged their full duty in the premises, and they are prepared to take any testimony that the witness may desire to give and which the Court thinks should be given under the ruling of the Court as made, in any matter that the Court may direct and to the full extent that the Court may direct.

THE COURT: Then, in order that there may be no misunderstanding on my part, on the part of the witness, or on the part of the defendant, as to the Government's position, the general rule applied to all questions heretofore asked in this case, namely, that any objection indicated in the opening argument or any specific objection advanced during the trial, may be understood to

apply to any question heretofore asked, will not prevail as to the further examination of this witness, and no objection will be understood to be taken to any of his testimony save such objections as may be made at the time the question is asked.

MR. ANDERSON: I may add that the Government in making objections to his testimony having, as I stated, discharged its duty in the premises as it sees it, will not make any objections on the ground of the disclosure of official information, under the ruling of the Court. If there be any other objections——

THE COURT: They will be whatever they are.

MR. ANDERSON: Yes.

THE COURT: I think the objections to the question now pending are not well taken. You may repeat the question and take the answer.

THE WITNESS: Your Honor, I was asked a question by Colonel Anderson, the answer to which has been delayed. I would be glad to answer that now if it were read to me.

THE COURT: Do you know what the question was?

THE WITNESS: It was in reference, I think, to imparting information. I do not know the exact extent to which that question referred, and Colonel Anderson was not sure whether he did not want to withdraw it, I believe.

MR. ANDERSON: If you feel that you can answer the question, Professor Stieglitz, I would like to have it answered. I have not considered it during lunch, I have been considering other matters. If you feel you can answer it I would like to have it answered.

THE COURT: What is the question?

MR. KRESEL: I have the question. It is here at page 3668.

THE COURT: Will you read it, please, Mr. Kresel.

MR. KRESEL: "XQ. 226. I shall ask you one other question, which you need not answer unless you wish to, and please do not answer until his Honor has had a chance to rule on it: Have you at any time in your discussion with the officers of The Chemical Foundation, or its agents, disclosed to them the processes employed by the several manufacturers of salvarsan under Federal Trade Commission licenses in the manufacture of that drug"?

THE WITNESS: I am ready to answer that no.

MR. KRESEL: Now may my last question be repeated.

(RDQ. 229 repeated as recorded above.)

A. Your Honor, I would much prefer to answer that in chambers, and all the subsequent questions which reveal information received. Personally I would prefer it. I see no public benefit that would result from a public discussion, as long as it comes before the Court and in the record of the evidence is sealed.

THE COURT: I would like to have that question read once more.

(RDQ. 229 again repeated as recorded.)

MR. ANDERSON: I would like to note an objection to that question, sir, on the ground it calls for a conclusion of the witness as to the method and processes used, and the effect thereof, rather than the statement of the witness of the actual facts; that it is a matter on which the conclusion is to be drawn by the Court.

THE COURT: I think, Professor Stieglitz, that the answer to that question is yes or no, and from my viewpoint, which I will have to let control, I do not believe that that need be taken in chambers. You need not explain. If an explanation

is called for we will take some action pertaining to that, but if you can answer that question yes or no, you may do so here.

THE WITNESS: Will you read it again?

(RDQ. 229 again repeated as recorded.)

THE WITNESS: You see, Judge, the difficulty is that he succeeded sometimes and sometimes not; it was a matter of the formula.

THE COURT: Then the extent to which he did succeed or failed to succeed, as I understand the question, was due or not due to the specific cause mentioned in the question.

THE WITNESS: I can answer that.

MR. KRESEL: Then do so, please.

THE WITNESS: I can answer that in my judgment in large part that was the source of the difficulty.

MR. ANDERSON: I did not get that, Professor.

THE WITNESS: In my judgment, in large part that was the source of his difficulties.

RDQ. 230. Professor, in answering one of Colonel Anderson's questions, you stated it is very important in producing a pure arsphenamine to start with a pure intermediate, the name of which you have given and which I shall not repeat, and then you were going on to give the facts, to illustrate your statement that it was of the utmost importance. I would like you now to state the facts which came to your knowledge and which show, as you say, the great importance in producing a pure arsphenamine, such as can be injected into the veins of a human being to be sure to start with a pure intermediate.

A. Your Honor, I have the records with me. I would much prefer to discuss this in camera.

THE COURT: I can appreciate your statements, Dr. Stieglitz, but the only ruling that I have made applies to the disclosure of trade secrets. It is

of importance that trade secrets be not disclosed any more publicly than can be avoided, so that my ruling does not apply on that, and while I can appreciate your personal opinion, I will ask you, if you will, to answer the question.

A. But I believe trade secrets are involved, your Honor.

THE COURT: Not in this question?

THE WITNESS: To get a close statement of fact, trade secrets would be involved.

THE COURT: Read the question.

(Question repeated.)

MR. KRESEL: I can see, your Honor, where that would be almost unavoidable. I am afraid it will lead to comparison of one procedure as against the other.

THE COURT: Is there objection on the part of the Government to the testimony being taken under the conditions as laid down this morning?

MR. ANDERSON: The Government does not object to any testimony any longer: subject to the form of objections which may be made on the grounds stated this morning and as the Court may direct.

THE COURT: Have you any other questions that you want to ask Dr. Stieglitz that will not involve——

MR. KRESEL: No, your Honor. The succeeding questions will be upon the same subject. Then I wanted to read to your Honor the two letters that Colonel Anderson put in evidence upon his cross-examination, which have not been read. That was going to be the extent of my questions.

THE COURT: You may do it now.

MR. KRESEL: The first letter, your Honor, is dated May 3, 1919, from Professor Stieglitz to Mr. Garvan (reading letter).

I read Mr. Garvan's reply thereto, dated May 9th. (Reading.)

THE COURT: The conditions under which the testimony will be taken in chambers are these: I shall ask Mr. Smart, who has been appointed the official stenographer in this case, to take the testimony in person, having it transcribed under the most secretive conditions practicable to him. Mr. Kresel, as representing the defendant, will, of course, attend, and Colonel Anderson may bring with him such persons as he desires without limiting the number or in any other way. The Clerk will necessarily attend. The testimony so taken will be available for as private use as possible for any purposes of this Court. The use of it in the usual briefs will not be permitted unless such permission be subsequently granted. It can be discussed orally or a supplemental brief may be prepared in such manner as counsel for the defendant desire.

The Government is at liberty, because it is Government information, to print it in its public briefs or otherwise. There is no restriction whatever in any way on the Government imposed by this Court. I reserve the right with respect to the testimony so taken or with respect to any other testimony subsequently taken in chambers to make as full reference to it in an opinion as I may feel that justice will require.

Is there any objection to those conditions on the part of anybody? If not, we will now retire to chambers and take the testimony.

(At this point, further testimony was given by the witness, in private, in the Judge's chambers.)

THE COURT: I want the record at this point to

show two things. Are you through with Dr. Stieglitz, both sides?

MR. KRESEL: Yes, sir; I am through.

THE COURT: Are you through with Dr. Stieglitz?

MR. ANDERSON: We are through with Dr. Stieglitz; yes, sir.

THE COURT: Then the Government may obtain as many copies of the testimony of Dr. Stieglitz taken in chambers as it desires. Mr. Kresel may have a copy upon request; or, if neither side wants any copies, the official copy will be open to counsel on either side at any time that it is desired by either party. Unless notified to the contrary, one copy only will be produced by Mr. Smart.

MR. ANDERSON: In order to observe the greatest possible care in complying with your Honor's rulings, I will only ask for one copy for the Government, to the end that I may have one for reference, and I will keep that in my own possession as far as it is possible for one to do who has not a safe. I would ask, therefore, that the stenographer give me one copy. If I need another I will apply to the Court.

THE COURT: And you, Mr. Kresel?

MR. KRESEL: Your Honor said I might have one copy. That is all I want.

THE COURT: Then, Mr. Mahaffy, you will notify Mr. Smart that three copies are all that are needed.

MR. KRESEL: Your Honor, there is a witness still under cross-examination, the accountant, but Colonel Anderson is not quite ready to go on with him. We have ten minutes before the adjournment, and I will call another witness or your Honor may adjourn, just as you like. I have a witness ready whom I can call immediately.

THE COURT: I shall leave the matter with you, Mr. Kresel.

MR. KRESEL: Inasmuch as there is only ten minutes and Colonel Anderson is anxious to have the adjournment promptly, I think it would be just as well to take the adjournment now.

MR. ANDERSON: The witness retired from the stand yesterday to make up certain statements. I understand they have been prepared with our accountants, but on account of the pressure of other duties I have not had a chance to either speak to the accountants or to see the statements.

MR. KRESEL: You will be ready in the morning?

MR. ANDERSON: I expect in the morning to be ready to go on with that witness.

THE COURT: Can counsel on both sides indicate the date of probable termination of this case?

MR. KRESEL: Your Honor, as far as our case is concerned, I think that we shall be through Tuesday afternoon. That is my best judgment. It may be another half day, but it certainly will not be later than Wednesday.

MR. ANDERSON: In that event, if your Honor please, of course, I cannot know just what is going to be introduced and therefore cannot indicate the extent of the rebuttal, but I think there is every probability that the Government will conclude any rebuttal that it will put on during next week. I cannot see any reason why it should go beyond that, and we may shorten it more than that.

THE COURT: What progress are you making with respect to the elimination of certain portions of the exhibits?

MR. ANDERSON: I have asked two of my associates to take charge of that, with full authority

to act in the matter of the reduction of the record. Mr. Kresel, I understand, has made a similar assignment, and I understand they have agreed on the elimination of a great deal of the very large exhibits introduced, where one exhibit was substantially the same as another, and are making substantial progress in getting the record into shape.

THE COURT: Was anything to be done with the record proper prior to the printing?

MR. ANDERSON: It was understood, sir, that the opening statements of counsel would be revised. I have not been able to revise but about fifteen pages. I propose to try to take it up on Sunday if more pressing duties do not prevent.

THE COURT: When that is done, there will be nothing to prevent the printer from going ahead?

MR. ANDERSON: There are a good many errors, I think, slight errors in the evidence, on which we could agree; but I am going to leave that entirely with my associates who are making up the record. As to the statements which I myself have made on the record, where they are more than merely brief statements, I am going to undertake to see that they accurately express what I intended to say, and if there are material changes, I will submit them to counsel on the other side or to the Court.

DEXTER NORTH.

DEXTER NORTH, a witness called on behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Mr. North, where do you reside?

A. Washington, D. C.

Q. 2. Are you an employee of the United States Tariff Commission?

A. I am.

Q. 3. What is your position there?

A. Special expert.

Q. 4. Have you with you a copy of the 1922 report about to be issued by the Tariff Commission?

A. On dyes and other organic chemicals?

Q. 5. On dyes and other organic chemicals.

A. I have.

Q. 6. Will you produce it, please?

A. I would like to make a statement concerning it, if I may.

Q. 7. Yes, I am going to ask you to do so, but before you make a statement, I am going to ask you this, Mr. North: Has this report been sent to the public printer for printing?

A. It has.

Q. 8. How long will it be before it will be finally printed?

A. Probably not later than August 1st.

Q. 9. Now you may make whatever statement you desire.

A. I wish to say that this report is not official, for the reason that it is subject to revision and subject to the correction of possible errors in the figures, and that I am requested by Commissioner Costigan, of the Tariff Commission, not to submit it unless I am ordered to do so by the Court.

MR. ANDERSON: If your Honor please, I would like to make a statement in that connection.

MR. KRESEL: Will you wait until I get through with a question or two, and then you may make such statement as you desire.

Q. 10. Has a summary of this report been made public?

A. Yes.

Q. 11. And released to the public press?

A. Yes, sir.

Q. 12. When?

A. July 9th.

Q. 13. The 9th of this month?

A. Yes.

THE COURT: By whom and by what authority?

Q. 14. Will you answer the question please?

A. By the authority of the Tariff Commission as a press release.

By MR. ANDERSON:

Q. 15. Was that a newspaper article, or was it a newspaper summary sent out?

A. To all the newspapers.

By MR. KRESEL:

Q. 16. It was a summary prepared by your Commission?

A. It was.

Q. 17. Sent to the newspapers?

A. Yes.

MR. ANDERSON: If your Honor please, I requested Mr. North to come, or rather telephoned the Department of Justice with the request that they would request the Tariff Commission to send up their representative with a copy of this report, and certain reports which had been introduced of which I did not have copies formerly, desiring the data in connection with the examinations which were then in progress. Mr. North came up and he brought me the printed official reports, but stated that the Tariff Commission under the law was not at liberty to disclose information which they had, even to officers of the Government, and that he had been requested by the Tariff Commission to request me not to put him on the stand if it could be avoided, and if I did

put him on the stand they desired to call my attention to the Statute on that subject, so, of course, I bring it to your Honor's attention. I said that of course I would conform to their wishes, but I did not ask Mr. North for any information, nor did I know that he had a copy of the report in his possession, and I have never seen it myself. The commission was disturbed, since their ability to get information on which they have to act is dependent upon their observation of secrecy in these matters, so that Commissioner Costigan came up to see me personally the night before last, he being an attorney, and I told him that my position was that in no circumstances would I ask the officials of the Government to disclose any information, which was by Statute or practice required to be kept confidential, and that I would, if the matter arose, bring to your Honor's attention this Statute, and at his request would object to the introduction of any evidence, though I knew it would not be necessary for me to object, if it was covered by Statute or their practice, after stating the facts to the Court. He expressed his satisfaction on this, and then the question of this report came up, and he said that Mr. North had brought up the report because the Department was a little indefinite what information was desired, with instructions to state to me these facts. I told him I did not know that, and he said he would ask me, in the event the question came up of introducing this report, to ask the Court not to permit it to be introduced, because it had been sent, or a summary had been given out to the press, of certain facts, and the official report was not yet submitted to the President; that it had been sent to the public printer for printing, and was subject to checking and revision; and there-

fore he did not wish the report in its present draft form to be made a public document, or to be published until they had carefully checked it over to see that it conformed with the requirements of the law on the subject, and also was accurate.

I therefore desire to make that statement to the Court, and to further state that what I stated yesterday or the day before, that the Government is perfectly willing if it would be any convenience to counsel or information to the Court, to agree at the Bar, on the record that this report when published, when it becomes an official document, may be used by either side in the trial of this case, or on an appeal in any court, or in the retrial to the same extent and with the same effect as if it had been formally introduced in evidence, and that I am told by the Tariff Commission that we can obtain as many as 100 copies if we want it, or more for use in this proceeding.

THE COURT: Have you anything to say, Mr. Kresel?

MR. KRESEL: Yes, your Honor. As to the intimation that there is anything illegal in the placing of this report in evidence, I am wondering whether I quite understand Colonel Anderson. Is he not referring to information upon which the report is based that is supposed to be confidential?

The report itself, when made public, is a public document which anybody may use. I do not understand that the Tariff Commission takes the position that there is anything in the law which prohibits the putting in evidence of one of their reports.

MR. ANDERSON: Not at all.

MR. KRESEL: Then that is clear. I was wondering why it was necessary to call into question

the Statute, because that is not involved here. We are not asking the Tariff Commission to tell us where they got the information from. The source of the information, I understand, is confidential under the Statute.

As to the report, I am very glad to have the stipulation suggested by Colonel Anderson. Our only difficulty is that we may not be able to obtain a copy of the report to place it in evidence here before this case is concluded—I hope we shall be through before the 1st of August.

So that I should like to have this carbon copy put in evidence with the understanding that if the final print as it comes out in any way differs from this carbon copy, the corrections may be made to conform this carbon copy to the final report as issued. That is my desire. Of course, we are entirely subject to your Honor's ruling in the matter. If your Honor feels that we ought not to mark this in evidence, I ask that it be marked for identification. I want to be able to compare the copy which is now produced with the final print so as to be able to see what changes, if any, have been made.

My offer, therefore, is to put this carbon copy of the report in evidence with the understanding that if any changes are made in the final print, they may be noted on this copy.

MR. ANDERSON: I feel constrained to object to the offer of counsel for several reasons: First, until this report is printed and submitted to the President, it is not an official report, and therefore is merely a record of the Tariff Commission that is subject to revision. Therefore, I do not think it is evidence or proof of the facts therein stated. I have never seen it. It is the first time

I have ever seen the cover and I know nothing about it.

MR. KRESEL: I have not looked at it, either.

MR. ANDERSON: Second, because I have been requested by the Tariff Commissioner, speaking for the Commission, on their behalf, to object to the introduction of this document, that this document is not in its final form, has not been finally checked and has not been submitted to the President to whom the report, I think, is required to be made.

For those two reasons, aside from the general objections which apply to all of this evidence, I am compelled to make the objection which I make.

I wish to add in that connection that the fact that the report is not introduced in evidence at this time, will in my view be entirely cured with the stipulation that it shall be considered and used as if in evidence. I will go further and let counsel now introduce a copy of the Tariff Commission's report for the period for which it is made, with an agreement on the record that it shall be treated as introduced in evidence and that the exhibit shall be supplied when the official report is finally printed. Either that, or we may agree now that it shall have all the effect of being introduced at the present time.

THE COURT: I am not sure that I understand your last suggestion, Colonel Anderson. If I understand it, it is that the Tariff Commission report, when made, shall be marked in evidence with the next consecutive number as an exhibit; but if I understand that suggestion, it does not enable the defendant to make use of that in the trial of this case and to offer further testimony in accordance with it. It seems to me that your first suggestion, that the copy now presented is as yet a

document that has not become an official document, is well taken. I do not see any reason why that is not practically an answer to accepting this in evidence; but have you anything to say to marking it for identification? I do not know that the matter of marking for identification is under my control. I never had that question raised before. Do you think of any reason why that should not be done?

MR. ANDERSON: I am, like your Honor, moving in an unknown territory. I also have never heard the question suggested before. I can think only of this reason: that the paper which is here presented, the compilation, which is, I understand, a preliminary draft of it, is subject to revision by the Tariff Commission. Whether they will revise the figuring on it, I do not know. There is no indication to me that they will. But it is subject to revision by the Tariff Commission until it is finally presented to the President.

Therefore, I do not think that their documents, compilations and drafts of reports are matters for use and identification outside of the Office, in any event. I think that this paper occupies the position of any other paper in process of completion in the office of the Tariff Commission. They might change it tomorrow morning, or they might not. I am not suggesting that they are going to change it.

THE COURT: I appreciate those difficulties; but in so far as my experience, theoretical and practical, has gone, as I understand those objections, they go only to the admissibility.

MR. ANDERSON: I started to object before the document was presented, of course. I do not think that counsel have a legal right to call a member of the Tariff Commission, or its representative,

and call for any of the documents in their office except such as are in final shape for publication, or are actually published. When I say "published," I mean delivered to the President, or used for that purpose. In other words, I do not think that without the consent of the Tariff Commission any data in their office can be presented, even for identification, and I do not think it is subject to examination.

THE COURT: I am assuming it is not subject to examination and is not now admissible.

MR. ANDERSON: Then may I suggest that it would seem to follow, if it is not subject to examination, that the paper cannot be identified, because it could not be identified except for the purpose of examination merely.

THE COURT: The only trouble is that the objections which go to the admissibility of the paper are not objections to its being marked for identification. I think we can solve that in a moment, though, without harm to anybody. But, may I make this inquiry, Colonel. A summary has been given out by the Tariff Commission. Do you see any objection to that summary being presented at this time, and, though I do not know whether it is desired to put it in or not, do you see any objection to that summary going in, to be supplanted by the original later?

MR. KRESEL: I was going to offer the summary any way, your Honor. That certainly is admissible—and admissible in evidence.

MR. ANDERSON: I have not seen the summary itself.

MR. KRESEL: I have it here.

MR. ANDERSON: If it is an official summary by

the Tariff Commission and they have given it out for publication, I shall not object. I am objecting, really, because of their request—except for the fact that this is not a public document.

THE COURT: Then that will be admitted subject to your general objections. But it seems to me, Mr. Kresel, that you may have this document marked for identification, but retained in the custody of the witness.

MR. KRESEL: Certainly, your Honor; I was not going to retain it.

THE COURT: You have no objection to that?

MR. KRESEL: I have not looked at it, as your Honor will see.

THE COURT: You have no objection to that?

MR. ANDERSON: I have not, sir.

MR. KRESEL: I will ask that this be marked with our next number, for identification.

Marked "Defendant's Exhibit Q," for identification.

Q. 18. Mr. North, I show you this paper and ask you to state whether that is the summary for the report 1922, made by the Tariff Commission, on dyes and chemicals, and whether that was released by the Tariff Commission July 9th (handing witness)?

A. It was.

MR. KRESEL: I offer that in evidence.

THE COURT: That is the document to which I referred a moment ago when I said it was admitted?

MR. KRESEL: Yes, sir.

Received in evidence and marked "Defendant's Exhibit No. 175." (*See Exhibits, Vol. V, page 3007.*)

THE COURT: You will retain the contents of this folder so that in case they are subsequently called for we will get the same papers.

THE WITNESS: Yes, sir

MR. KRESEL: That is all, Mr. North. I thank you very much.

THE COURT: Any questions, Colonel Anderson?

MR. ANDERSON: No, sir.

(Witness excused.)

MR. KRESEL: I think, your Honor, I will take a minute or two to read some portions from this. (Reads from Defendant's Exhibit No. 175.)

MR. KRESEL: Now, Professor Stieglitz will you resume the stand?

MR. ANDERSON: One moment, if your Honor please. I would like to have it a little clearer about this report, so that there may be no question in the future; and I wish to say in order to avoid any misapprehension, that as to the ground of our objection, of course I think your Honor understands, it is not that the Government is not as much gratified as anybody can be as to the showing of the dye industry in America; but it is our position that this is not an issue, or relevant in this case, that we are trying. I want to make clear that our objection is that it has no material bearing and no relevancy to the case here because that was not involved in the transaction under review. Of course the Government is as much gratified as anybody in these reports, and I would like to see them better.

THE COURT: I understand your position. That is all I need say.

MR. ANDERSON: Yes, but since I objected to the introduction of this document, I do not want

to be put in a position of misapprehension on the part of anyone, that there is no objection to those figures. I wish to say with regard to the Tariff Commission report, is it agreed that the report when finally published may be used in this court on trial, or re-trial, or in any Appellate Court at any time with the same effect as if introduced in evidence today?

MR. KRESEL: More than that, Colonel, I understood the Court's suggestion, which I am very glad to follow, and I now offer the Tariff Commission report for 1922, and ask that an exhibit number be assigned thereto, the actual document to be supplied as soon as it comes from the printer.

THE COURT: But not to be printed among your exhibits.

MR. KRESEL: No, your Honor. We are endeavoring to cut out a great deal.

MR. ANDERSON: I have no objection whatever to the limitation that it is not to be printed, and I will ask the Tariff Commission to supply us with 100 copies of that report.

THE COURT: And it may be marked as a separate volume of the record.

MR. ANDERSON: Certainly; and the Commission promised me that they would supply us with 100 copies, and I will communicate at once with them to increase the number if necessary to that end.

Received in evidence and marked "Defendant's Exhibit No. 176." (*Not printed.*)

THE COURT: We will adjourn court until tomorrow morning at 8.30.

(Whereupon at 2.50 P. M. adjournment was taken to Saturday, July 14, 1923, at 8.30 o'clock A. M. standard time.)

CHARLES L. PARSONS.

CHARLES L. PARSONS, was called as a witness on behalf of the defendant, and being first duly sworn testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Will you please give your full name and address?

A. Charles L. Parsons, Washington, D. C.

Q. 2. And what is your profession?

A. Chemist.

Q. 3. Now, Doctor, I shall have to ask you to tell us something about your education and experience.

A. I was graduated from Cornell University in 1888. I was Chemist at the New Hampshire Experiment Station from 1889 to 1893. Professor of Inorganic Chemistry and head of the Chemical Department, New Hampshire College, 1893 to 1911. Chief Chemist of the Bureau of Mines, 1911 to 1919.

Q. 4. Just stop there a minute, please. Bureau of Mines of what?

A. Of the Interior Department.

Q. 5. Of the United States?

A. Of the United States. I was given an honorary degree in 1911 by the University of Maine as Doctor of Sciencé; Doctor of Chemistry by the University of Pittsburgh in 1915.

That is the extent of my educational experience.

Q. 6. Are you a member of any of the Chemical societies?

A. I am a member of the American Chemical Society. I am a member of the Institute of Chemical Engineers; of the Societe Chimique de France; the Societe Chimie et Industrie; Society of Chemical Indus-

try of England; Fellow of the American Chemical Society.

Q. 7. Are you a member of the American Association for the Advancement of Science?

A. I am a Fellow of the American Society for the Advancement of Science and secretary of the American Chemical Society since 1907; Vice-President for America of the International Union of Pure and Applied Chemistry, 1920, 1921 and 1922. I was Chief Chemical Engineer for the War Department for special nitrogen investigations in Europe in 1916, being transferred from the Interior Department to the War Department for that purpose. I was a member of the Nitrate Supply Committee in 1917.

Q. 8. Was that a Government Committee?

A. A Government Committee. I was consultant to the Inter-departmental Board on its trip through the south in the early part of 1917 to investigate sites for nitrogen plants.

I was a member of the Nitrogen Commission of the War Department during the war; was a member of the Advisory Board on Gas Warfare; and I was in full charge of the construction and operation of Chemical Plant No. 4 at Saltville, Virginia, where there were 350 officers and men reporting to me direct. I was Chairman of the Board on Zirconium steel and light armor; and following the war I was a consulting chemist.

Q. 9. Just before you get to that, I want to take you only up to the war for the present. I would like a little more explanation, if you will, Doctor, about these various Governmental bodies that you were connected with. To begin with you say that you were chemist of the Department of Mines.

A. Bureau of Mines, Department of Interior.

Q. 10. Chief Chemist?

A. Chief Chemist.

Q. 11. And for how many years were you Chief Chemist there?

A. From 1911 until November, 1919. During the first two or three years the word "chief" was modified by "mineral" in one case and afterwards the word "mineral" was taken out and I was made "Chief Chemist."

Q. 12. In other words, the designation was changed?

A. The designation was changed.

Q. 13. When was it that you were transferred from the Bureau of Mines to the War Department?

A. I think it was in the late summer of 1916, or possibly the early fall. It was August or September of 1916.

Q. 14. When was it that you went abroad for the War Department?

A. I left in the latter part of September, about the middle of September, 1916.

Q. 15. I shall not inquire now just what the purpose of your trip was. All I want now is for you to tell me how long you were gone on that mission?

A. I returned the day before Christmas. On the 24th of December, 1916, I landed in New York City.

Q. 16. Upon your return, did you become a member of any Government Committee or Commission?

A. I was made a member of the Nitrate Supply Committee when it was formed in March, I think, following my return.

Q. 17. Can you state who the members were of the Nitrate Supply Committee? Perhaps you would like this to refresh your recollection.

A. I can give you most of them from memory, but I will have it complete, if I may use this. (Taking paper.)

Brigadier General William Crozier, Chief of Ordnance, U. S. Army; Rear Admiral Robert Earle, Chief of the Bureau of Ordnance of the Navy Department; Brigadier General William M. Black, Chief of Engineers, U. S. Army; F. W. Brown, Bureau of Soils, Department of Agriculture; Dr. Leo H. Vaekland of Yonkers, N. Y.; Dr. Gano Dunn, 43 Exchange Place, New York; Dr. Charles H. Herty, of New York; Dr. William F. Hilbrand, Chief Chemist of the Bureau of Standards, Department of Commerce; Dr. Arthur A. Noyes, Institute of Technology, Boston, Massachusetts; Dr. W. R. Whitney, of Schenectady, New York; and myself.

Q. 18. Subsequent to your becoming a member of this Nitrate Committee, what other Government Committees or Commissions did you become a member of?

A. I was a member of the Nitrate Commission and I was Chairman of the Board of Zironium Steel. I was a member of the Advisory Board on Gas Warfare.

Q. 19. Let us take up the first one. You say you were a member of the Nitrate Committee?

A. Nitrate Committee, afterwards Nitrate Commission, which was a Committee of the War Department.

Q. 20. Would you state who were the members of that Committee, please?

A. Dr. Arthur A. Noyes, Leland E. Summers, W. R. Whitney, Gano Dunn, Admiral Earle, and I think General Wheeler of the War Department, Chief of Ordnance, was present although I do not think he was officially a member, and myself. Colonel Joyes, I believe, of the Nitrate Division also was a member of the Committee. He was a representative of the Army.

Q. 21. As to the Advisory Board on Gas Warfare, who were the members of that beside yourself?

A. Dr. Ira Ramsey, of Johns Hopkins; Dr. Theodore Richards, Harvard University; Dr. William Hoskins, of Chicago; Dr. William H. Nichols, of New York, who was Chairman; and myself. That is all I remember.

Q. 22. Do you know with what concern Dr. William H. Nichols was connected?

A. Dr. William H. Nichols was Chairman of the Board of the General Chemical Company. He was, at that time, however, in the Government service, serving in an advisory capacity and spending his time in Washington; a dollar a year man.

Q. 23. Now, Doctor, I first want to have you tell us what you did on your trip abroad for the War Department. Before answering the question, I am not going to ask you to state anything that you did for the Government that you did not subsequently report and which report is a public document. Do you understand me? I desire you to confine yourself entirely to whatever you did for the Government which is in the form of your report, which I am about to introduce?

A. I visited England, France, Italy, Norway and Sweden, with special reference to the processes for nitrogen fixation, attempting to get at the same time all the information I could in those countries from engineers whom I might come in contact with and whom I went to see in Norway and Sweden regarding the German Haber process.

Q. 24. I am going to stop there, Doctor, to take up with you this question of nitrogen fixation, because we do not understand it the way you do?

A. Yes.

Q. 25. In the first place, please state in what activities in our national life nitrogen is important?

A. Why, nitrogen is not only important, but es-

sential to agriculture. It is essential in our industries, and it is required for all explosives.

Q. 26. Now, when you say "in our agriculture," in what way is nitrogen essential in agriculture?

A. As a fertilizing material.

Q. 27. And in explosives?

A. All explosives contain nitrogen, and that nitrogen has to be in combined form before it can be introduced into the explosive. The fact is the quality of the explosive depends solely on the nitrogen it contains and the way it is confined and the amount of gases given off by its decomposition.

Q. 28. And in what avenues of commerce is nitrogen essential or important?

A. I do not quite understand your question.

Q. 29. How is nitrogen used in commerce?

A. It is used in many of our industries. It is used—

Q. 30. For example?

A. As a refrigerating material, to produce cold in storage, and in our cold storage warehouses, and in the production of artificial ice. It is used in the production of sodium carbonate which is used in the production of glass.

Q. 31. That is sufficient.

A. It is used in the dye production; in fact, there are very few chemical manufacturers that do not have to use nitrogen compounds in some form.

Q. 32. Now, Doctor, I wish you would tell us what the sources of nitrogen are; where is that element obtained?

A. Nitrogen for fertilization is obtained to a considerable extent from animal and vegetable materials, and refuse, such as cottonseed meal, tankage, and manure, and various other forms which you probably do not care to go into in detail. It is obtained in large

quantities from a deposit in Chili, known as Chilian saltpeter which is a sodium nitrate. It was until the early part of this century the chief source of our inorganic nitrogen. It is obtained in large quantities also from the gas which is produced in the by-product coke ovens, the ammonia being washed out of that gas. That is a very large source of nitrogen, and it is obtained by bringing the nitrogen of the air——

Q. 33. I am not asking you how it is obtained. It is obtained out of what?

A. Out of the air.

Q. 34. Out of the air. We will come to the processes in a little while. Is nitrogen naturally found in the soil?

A. To a limited extent, in combination, yes.

Q. 35. And is that element essential to the growth of plants?

A. Absolutely.

Q. 36. Now, the Chilian saltpeter, is that found as an element?

A. That is found as sodium nitrate in combination.

Q. 37. It is a deposit in Chili?

A. It is a deposit in Chili.

Q. 38. Which is mined or dug?

A. Which is dug, and dissolved in water, and the water evaporated and the sodium nitrate so produced is brought into commerce for agricultural purposes, and is a basis for the production of nitric acid.

Q. 39. Now, you spoke of the by-product coke ovens. I wish you would make that a little plainer, please. Tell us what a by-product coke oven is; tell us what is being done when this gas is produced, and how that is made into nitrogen or ammonia?

A. Well, a few years ago, all of the coke required for metallurgical operations was made in bee hive ovens, that is very much the same as charcoal is pro-

duced. The coal used was a bituminous coal which was heated, and the gas which came therefrom was burned, and all of the material which came off in that gas, went to waste. Later, as science and manufacture developed by-product coke ovens were introduced. In these ovens the coke is heated in special brick-lined furnaces from the outside, so that gas is given off. That gas is collected and carries with it a number of very important products, such as toluol and benzol, which are important commercial products, ammonia and some other compounds. The ammonia with which we are immediately interested, as it is a nitrogen compound, is washed out by water. That is then usually neutralized by sulphuric acid and goes into commerce in the form of ammonium sulphate for fertilizer purposes. It need not necessarily go through that form. It can be obtained as ammonia water, aqua ammonia, direct.

Q. 40. Nitrogen, then, as it comes to us in commerce, is in the form of ammonia usually?

A. It depends on where it comes from. If it comes from Chili it is in the form of a nitrate. If it comes from these other materials, it is usually in the form of ammonia or some of its compounds.

Q. 41. And then it will be either ammonia sulphate or ammonium nitrate, depending upon what acid it is combined with?

A. Correct; but there is practically no ammonium nitrate used except in explosives.

(At this point a five-minute recess was taken by direction of the Court.)

Q. 42. Dr. Parsons, you have stated that one of the sources of nitrogen is the air. What is the combination in which nitrogen appears in the air?

A. It is not in combination. It is there as free nitrogen, and as such is unavailable either to plants or for explosives. It is unavailable to any use until it is brought into combination.

Q. 43. And in what proportion does nitrogen occur in the air in proportion to other elements?

A. Approximately four-fifths.

Q. 44. That is, four-fifths of the air is nitrogen?

A. Yes.

Q. 45. You have spoken of fixation of nitrogen. Will you please define that term?

A. It is the bringing of that free nitrogen of the air into combination, so that it may be useful to man.

Q. 46. How many processes of fixation of nitrogen are there known?

A. There are four essential classes of commercial fixation.

Q. 47. Will you mention them?

A. The arc process, the cyanamid process, the various processes which are generically spoken of under the term of "Haber Process," and the cyanide process.

Q. 48. In what other way is this generic denomination of the Haber process called?

A. The synthetic ammonia or the direct ammonia process.

Q. 49. That is what I thought. I should like for a very few minutes, Doctor, to have you describe to the Court these various processes, and first please take the arc process.

A. The arc process has been installed and has been commercially successful only in Norway. It is there installed in very large plants using something over 200,000 horse power.

The air is carried through an immense electric arc and at that high temperature a small portion of the nitrogen of the air combines with the oxygen of the air to form oxides of nitrogen. Those are cooled as quickly as possible, are then during the cooling combined with more oxygen from the same air that went

through the arc, and this oxide of nitrogen is washed out with water in immense towers, to form nitric acid. That nitric acid then has to be concentrated if it is to be used for explosives or neutralized with lime to form lime nitrate, which goes very largely into agriculture, or neutralized with ammonia, as it was very largely during the war, to form ammonia nitrate, which was used in explosives and was a very prominent part of the bursting explosives, known as ammetol, which was composed of some 80 per cent of the nitrate, and used to a great extent in the war.

Q. 50. Please describe the cyanamid process?

A. The cyanamid process was the next in order to the arc process in its establishment and commercial development. In the cyanimid process limestone is first treated to form quick lime. That lime is then mixed with coke or with anthracite coal in an immense electric furnace, is heated to a high temperature, and under those conditions the calcium of the lime and the carbon of the coke combine together to form calcium carbide.

That calcium carbide is then ground to a powder, but in specially constructed furnaces, a portion heated to a yellow heat, and nitrogen from the air, which has been separated by some form of liquid air plant, is run into this furnace. Under those conditions the nitrogen of the air combines with the calcium carbide to form calcium cyanamid, so that the nitrogen is then brought into combination.

That calcium cyanamid in that form is generally spoken of as lime nitrogen. It is available to a certain extent in mixed fertilizers, but if it is to be used by itself for fertilizer purposes it must be first treated, usually by an oiling process, so that it can be spread upon the soil. The lime nitrogen may be put into large boilers or autoclaves, mixed with lime and a little

soda, and under the effect of high pressure steam another reaction takes place so that ammonia comes off as ammonia gas. That ammonia gas brings the nitrogen into the form that it is usually desired. If the ammonia must be used for explosives another reaction takes place. It is mixed with air, about ten per cent of ammonia to about 90 per cent of air is passed over heated platinum gauze and you obtain a gas containing about 10 per cent of oxide of nitrogen, which is nearly ten times as strong as that which comes from the arc process, and again the nitric oxide is combined with the oxide of the air to a higher state of oxidation, are dissolved in water to form nitric acid, giving you a stronger nitric acid than you can hope to obtain by the arc process, and that nitric acid after concentration is available for explosive production or for any purpose for which nitric acid is used.

Q. 51. Now please describe the cyanide process?

A. The cyanide process is commercially the least important of any of these processes, and when it comes to a question of explosives or of fertilizers it has not yet been brought into real commercial use. But it is a nitrogen fixation process and sodium cyanide is made thereby. In the cyanide process a mixture of coke, usually petroleum coke, and sodium carbonate, soda, with a certain proportion of finely ground iron, are mixed together, heated to approximately 1,000 degrees Centigrade and nitrogen from the air, first having been separated by the liquid air method of which I have already spoken, is passed over or through this material and under those conditions combines with the sodium of the sodium carbonate and the carbon of the coal to form sodium cyanide.

Q. 52. Now please describe the direct synthetic ammonia process?

A. The direct synthetic ammonia process consists

simply in bringing pure nitrogen and pure hydrogen together at approximately a red heat in the presence of a catalytic material which will enable them to combine. They then combine directly to form ammonia.

Q. 53. Is there any pressure required?

A. Under high pressure, yes.

Q. 54. Let us see if I got it. The direct synthetic ammonia process is the combination of hydrogen and nitrogen, both of them pure, under pressure at red heat and in the presence of a catalyst?

A. Right.

Q. 55. Please define a catalyst?

A. A catalyst is a material which speeds up a chemical reaction or enables it to take place to a greater extent than it would if a catalyst was not present. The catalyst itself usually does not take part in the reaction and is the same material when the reaction is through as it was at first. We have many instances of that in chemical industries.

Q. 56. Is there more than one direct synthetic ammonia process?

A. Yes.

Q. 57. Please tell us what they are?

A. Well, there are three of real importance judged from their commercial development. The Haber process *per se* has developed in Germany, which is causing nitrogen to combine there in very large quantities, and was the basis upon which Germany was able to continue the war. In Germany there are two large Haber plants, one at Oppau and one at Merseburg. The first fixes approximately 100,000 tons of nitrogen per year and the second about 200,000 tons, which is far more than is produced in any other part of the world.

The Germans operate under pressure of 200 atmospheres and have developed one of the largest and

most complicated engineering chemical developments or engineering developments of any kind that has been developed in the world. They started in in 1913 with the production of some six or seven thousand tons of nitrogen, and as they were unable to get explosive materials during the war they developed so that in 1918 they were producing approximately the quantities which I have given, and they are still producing for fertilizer purposes. They work in very large steel barns.

Q. 58. Just before you go to the next process will you state what is meant by an atmosphere?

A. A pressure of 15 pounds to the square inch. I will do my best to avoid these terms to which I am so accustomed.

Q. 58-a. That is all right. I want you to use the terms, but I am going to ask you to explain them to us. You say that the Germans' direct synthetic ammonia process is operated under 200 atmospheres.

A. Approximately 3,000 pounds to the square inch.

The next in order of development was the General Chemical Company's process which so far as the basic reaction is concerned is the same as the Haber, and has often been referred to as a modified Haber process on account of that fact, simply because it uses the same basic chemical reaction, the direct combination of nitrogen and hydrogen.

The General Chemical Company's process was installed or attempted to be installed during the war in nitrate plant No. 1 at Muscle Shoals. It works under 100 atmospheres pressure. That is slightly below 1500 pounds per square inch. That is now operating in a considerable sized plant at Syracuse, run by the Atmospheric Nitrogen Corporation, and has run very successfully from the day the plant began operating, which was in August, 1921.

Q. 59. And you say that that works under atmospheres below one hundred.

A. Works under atmospheres below one hundred. They had a very special catalyst of their own.

Q. 60. I am coming to the catalyst in a little while. Now, what is the third?

A. The third is the Claude process, which is being developed quite rapidly in France, and which has most excellent prospects for the future. The Claude process began to be known about late in 1918 or early in 1919, I think I got my first details of it in 1919, although Claude had been working on it in France for some time before.

The Claude process has some very unique features. It works under higher pressure than any of the others. He was supposed to work normally under one thousand atmospheres pressure, as plants actually work under nine hundred atmospheres pressure, which is four and a half times the pressure used by Haber, and of course, something over nine times the pressure used by the General Chemical Company's process—The Atmospheric Nitrogen Corporation.

Q. 61. Will you stop there a minute. I now desire to read from Defendant's Exhibit No. 140. I read from Page 55 of that exhibit, which is a Report on the Fixation and Utilization of Nitrogen, prepared by the Nitrate Division, Ordnance Office, War Department, assisted by the Fixed Nitrogen Research Laboratory, Department of Agriculture.

Mr. Kresel: Before reading the particular portion that I desire to read in connection with this witness's testimony, I think it might be well that your Honor should have before you an extract from the introduction of this report. I shall read one paragraph. It is entitled, "Introduction—Purpose."

"This report has been prepared in order to correlate and make available under one cover such information on the fixation and utilization of nitrogen, collected by the Nitrate Division since its organization in July, 1917, as may aid in the further development of that art in the United States. It is based to a very considerable extent on reports, papers, and articles prepared by the officers and civilians associated from time to time with the activities of the Nitrate Division, as well as on the published technical and economic papers of several others. In order that it may be of further help to those who desire to make a more detailed study of any of the several phases of this subject, a bibliography of many of the papers pertaining thereto that have appeared in the last few years has been prepared and is included."

Q. 61. (continued) Then under the heading of "Utilization of Nitrogen" and under a sub-heading reading "For Military Explosives," this report states:

"Almost without exception all military explosives are nitrogen compounds. Owing to the slight affinity between nitrogen and the other elements with which it enters into combination, many of its compounds are unstable and can be decomposed with the almost instantaneous evolution of heat and gas."

I now read from page 55 of that Exhibit 140 the following:

"The various modifications of the synthetic process which are being developed outside of Germany have certain distinguishing characteristics. The direct synthetic plants in Germany use 200 atmospheres pressure, the American plant 100 atmospheres, and the Claude process in France 600 to 1,000 atmospheres. The Italian and French plants use electrolytic hydrogen; the German and American use producer gas or water gas as a source of hydrogen."

That is what you were referring to in your testimony?

A. Yes, except that I stated that Claude used nine hundred atmospheres. I visited the Claude plant and went through it, so I know the actual operation. There is no secret about it.

Q. 62. I will read in this connection from this Exhibit No. 140, page 97:

"There are today in general four definite developments of the Haber process for the direct synthesis of ammonia: The original German (Haber), the American (General Chemical Co.), the French (Claude), and the Italian (Casale). The conditions necessary in all of these processes to bring about an appreciable combination of hydrogen with nitrogen, even in the presence of the best reaction promoters or catalysts so far developed, involve pressures of over 100 atmospheres, and temperatures of 450 degrees C. to 600 degrees C. The concentration of ammonia thus obtained in the nitrogen-hydrogen mixture, according to present industrial practice, is of the order of 5 to 10 per cent. The four developments are fundamentally similar, differing essentially in the operating pressures (100 to 1,000 atmospheres) used for synthesis and in the methods for removal of ammonia from the gases (liquefaction by cooling and absorption). There are in all of the processes the mechanical difficulties attendant to operation under combined high temperatures and high gas pressures, and there is the need of an active, rugged, cheap catalyst which will operate at as low temperatures as possible. There are two principal methods used to produce the raw gases for the process, the Bosch water gas and the water electrolysis.

"The German process developed by Haber uses a pressure of about 200 atmospheres, and the catalysis temperature is about 500 degrees C. The synthesis takes place in a circulating system from which the ammonia is removed by water absorp-

tion. The units employed in the German commercial installation are of large capacity, each catalyst bomb synthesizing about 15 tons of ammonia per day.

"The American process was developed by the General Chemical Co. and involves pressures of approximately 100 atmospheres. The low pressure utilized in this process was made possible by the activity of the catalyst developed by the General Chemical Co. The greater the activity of a catalyst, however, the greater is its sensitiveness to poisons in the gases. It is therefore necessary that great precaution be taken in the purification of the gases. The synthesis takes place, in this process also, in a circulating system from which the removal of ammonia is accomplished by refrigeration and liquefaction at extremely low temperature (—40 degrees C.), the low temperature being necessary in view of the small concentration of ammonia obtained at the comparatively low pressure of 100 atmospheres. Commercial units have been built with rated capacities of 5 to 10 tons of ammonia per day each."

Now, Doctor Parsons, you have spoken of the essential combination of hydrogen and nitrogen in each of these three processes; that is right, is it not?

A. Correct.

Q. 63. Are you familiar with the so-called Haber patents, the United States Haber patents?

A. I am.

Q. 64. Is this essential step, or rather, is this step which is common to all the three processes, namely, the combination of hydrogen and nitrogen covered by any patent?

A. It is not.

Q. 65. Then, as far as we have proceeded, the process developed by the General Chemical Company differs from the German Haber processes covered by these United States patents that are involved here in

two respects: The General Chemical Company process works under lower pressures, namely, one hundred or less atmospheres, and the General Chemical Company has developed a special catalyst; is that right?

A. Those are the two chief differences, yes.

Q. 66. The Claude process, which you say is the one developed in France, as I understand your testimony, differs from the German Haber process chiefly, in that it uses a much higher pressure, namely, between six hundred and nine hundred atmospheres, as against two hundred used by the Germans?

A. That is one of its great differences. It has other important differences.

Q. 67. For the present, we will confine ourselves to that. I want you to come back, if you will, to your trip abroad in 1916. Please tell us what countries you visited, what plants you observed with whom you talked, not stating what was said to you?

A. May I preface that by a statement of some activities that I had just before that?

Q. 68. If you will, please.

A. Previous to leaving for New York I had been for several months in consultation with General Crozier of the War Department; and in connection therewith the War Department had requested the Interior Department to undertake certain investigations regarding the oxidation of ammonia to nitric acid. An arrangement was made between the Bureau of Mines and the Semet-Solvay Company, whereby extensive experiments were carried out at Syracuse, under the joint direction of L. C. Jones, the Chief Chemist of that Company, and myself. Those were the first—no, it was not the first. I was going to say they were the first installation where an attempt was made to oxidize ammonia. The American Cyanamide Company

had already an installation under way, but it was a private installation. That was the first public attempt to oxidize ammonia, as it was extremely important to do that. We had considerable amounts of ammonia available from our coke ovens. Those plans were drawn and operations were started before I left for Europe and were continued while I was away; and from them, processes for ammonia oxidation were developed, which are in use in plant No. 1 at Muscle Shoals and are commercially used in the country today in the oxidation of ammonia.

Q. 69. Will you permit me to put a question there? You say that this work which you have just described at Syracuse was done under the direction of Mr. Jones, representing the Semet-Solvay Company, and yourself. You were representing in that, whom?

A. The Bureau of Mines. We were acting both of us jointly at the request of the War Department.

Q. 70. Please tell us what is meant by oxidation of ammonia?

A. It is the conversion of the nitrogen in the ammonia to the nitrate form so that it is available for explosives.

Q. 71. Now then, I return to my original question about your trip.

A. I landed first in England and spent some little time there in consultation with the chemists of the Munitions Department on their nitrogen fixation experiments.

Q. 72. You mean the British Munitions Department?

A. The British, yes. They had established a laboratory and had obtained special experts to study these same questions and were working at that time in University and College laboratories. They had made some very interesting developments and those developments

were continued. The laboratories were enlarged. By the time the war was over, they had proposed that the British Government attempt to operate the direct ammonia process.

Q. 73. Will you stop there, please. You say that they were experimenting. Were they experimenting with the question of the fixation of nitrogen?

A. The fixation of nitrogen by direct composition of nitrogen and hydrogen.

Q. 74. Now, will you let me put another question?

MR. KNIGHT: I do not want to be captious, but it seems to me that if this Professor will confine his answers to the question and not go over what happened after he left there to these various plants, it might shorten the examination.

Q. 75. Dr. Parsons, is it the fact that the Germans had taken out patents covering their German Haber process in England?

A. Yes.

Q. 76. And in France?

A. Yes.

Q. 77. Will you proceed now, Doctor?

A. From there I went to France and was given every facility by the French Government to study all of their plants and developments. I spent most of my time while in France in the powder factory at Angouleme studying the oxidation of ammonia. They had cyanamide plants also operating in France and they had established at Roulone, in Southern France, in the Pyrenees Mountains, a small arc plant where they hoped to make nitric acid direct. That plant was just in process of installation and was not producing to any extent while I was there. It was being built, but I saw a great deal about the methods of construction.

MR. ANDERSON: Will your Honor permit me to inquire? We are proceeding this morning un-

der the General Rule, are we not, without taking objections to any evidence?

THE COURT: If you have specific objections, it will probably enable me to understand and apply the testimony to let me know what objection you have in mind to this testimony besides irrelevancy.

MR. ANDERSON: There are a number of questions which I do not think are material. I do not want to object to them. It just occurs to me that the question that he was asked whether patents had been taken out in England is objectionable. If the statement is of any value whatever, he would have to produce the patents to show that they conformed to the same rules we have in America. I do not know the relevancy of it. I do not want to object and require the best evidence of whether they have taken out patents in England, unless it has something to do with the case. If we are going to prove patents in England or patents in any other country, they ought to produce the patents. If they have any value at all, we should know what the status is. Therefore, I will object, and if necessary make a motion to strike that question and answer out simply because I do not see its relevancy in the first place, and in the second place it is not evidence. Therefore, if they undertake to confine the evidence reasonably to the rules of evidence, I will not object.

MR. KRESEL: Do I understand that a motion is now being made to strike that out?

MR. ANDERSON: To strike out any statement as to English patents or having taken out patents in England, because we haven't got them. If I knew the facts, I would be willing to admit them. I do not want to be put in the position of permit-

ting illegal evidence to go in, which it might later be argued possibly is material and may have a bearing on the case, which I can not conceive of at the moment. I do not like to be left in that position on the record.

THE COURT: Have you anything to say, Mr. Kresel?

MR. KRESEL: I have this to say, your Honor, that my sole question was whether the Germans had taken out patents in England and France. The answer was in the affirmative.

MR. ANDERSON: Covering the Haber process.

MR. KRESEL: We had the same question up with Dr. Holdermann, who, your Honor will recall, testified as to the taking out of patents in Germany, where he undertook to say and was permitted to say that the United States Haber patents were similar to the German Haber patents. Now, I think that the rule contended for there by the Goverment is equally applicable here. As to the materiality thereof, I shall develop that in a little while. That is not my present purpose. All I wanted to show was that there were patents taken out in those countries.

MR. ANDERSON: I understand that a motion has been made to strike out the evidence of Dr. Holdermann on that subject, if it applies to that point. I do not recall particularly. It may have been brought out on cross-examination. I do not recall that record way back there. But if it was subject to objection, and if the objection was good, that is all right. Whether it was or not would depend upon the circumstances. If it was subject to a motion to strike out, which motion I do not care to take up now, that would be a question for future argument. All I wish at this time is to

reserve the point on that so that I may not be injured by a record which may become material.

MR. KRESEL: That is all right.

THE COURT: I did not quite understand your position before. I do now. You are making clear at this point your objection should you decide to press it later.

MR. ANDERSON: If the Court does not desire to rule upon it, I just ask you to reserve the point. I only specified it because your Honor suggested it. That is the reason why I asked whether your Honor was proceeding under the general rule.

THE COURT: I did not have in mind just what you had in your mind. That was all.

Q. 78. Will you proceed, Doctor, please?

A. In France, as in England, I got in touch with every engineer and chemist whom I could hear of or could learn from the Governments had any information on the nitrogen situation or nitrogen processes.

From France I went to Italy and went through the explosive factories at Cerni, and after some little wait, I obtained permission to visit the cyanamid factories at Perni, which was one of the largest and most interesting cyanide plants in the world. Also in Italy I was in consultation with the Italian engineers and chemists on these matters, getting all the information I could on the subject.

From Italy I came back through France picking up some loose ends; went again to England, and in England I was permitted to visit and see the erection and part operation, because it was only just at that time beginning to operate, of the ammonia oxidation plant which was at Dagenham Docks, just outside of London.

From England I went to Norway. I was in consultation there with the Norwegian engineers and chem-

ists; visited the large plants at Notodden and at Rjukan, which were being operated by the arc process, where they were making ammonia nitrate to the extent of something like 240,000 tons of ammonia nitrate a year, which material was going almost wholly to the Allies for the production of ammotol.

From Norway I went to Sweden and visited the cyanamid plant, which was made by a somewhat different process, at Lunga-Werke. Came back to Stockholm and was in consultation with the Karlsons there, who were the special Swedish experts along those lines.

Went from there to Goettenburg in Sweden, where I went into the details of processes, cyanide processes, that were being developed there; and from there back through Norway and home, through France and in Italy, and back to France again.

I was in the company most of the time of Mr. Eysten Berg.

Q. 79. Who was he?

A. He is a Norwegian who has had and had had at that time many years of experience in nitrogen fixation.

Q. 80. What was his official connection with your mission?

A. He was engaged also by the War Department for this investigation to accompany me and assist me in the matter. I had the benefit of his advice throughout that time, and was very largely assisted by his letters of introduction, when I went to Norway and Sweden.

Q. 81. Through all your travels and investigations which you have just described, you have not mentioned seeing or hearing of a single plant that was using the direct synthetic ammonia process.

A. There was none.

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Q. 82. Did you get into Germany?

A. I did not.

Q. 83. Of course, that was during the war?

A. It was before we went into the war.

Q. 84. Yes. But it was in 1916 that you are talking about?

A. In 1916.

Q. 85. Have you made a report to the War Department upon the results of your investigation?

A. I have.

Q. 86. Look at this document and state whether that contains your report?

A. It does.

Q. 87. Is there more than one report that you made upon the subject?

A. Two.

Q. 88. And are they both contained therein?

A. They are.

MR. KRESEL: Colonel, have you ever seen this, and may I offer it?

MR. ANDERSON: Yes.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 177." (*See Exhibits, Vol. V, page 3017.*)

Q. 89. Dr. Parsons, when did you sever your connection with the War Department?

A. Shortly after my return, about the first of January, 1917—my official connection.

Q. 90. When did you cease to act on all these committees in connection with the War Department which you have described?

A. Throughout the war.

Q. 91. Since the close of the war what have been your activities in the matter of nitrogen and the fixation of nitrogen?

A. In the early part of 1920 I was approached by the Atmospheric Nitrogen Corporation to act for them in a consulting capacity and consented to do so, beginning my connection with them in April, 1920. I continued in a consulting capacity with the Atmospheric Nitrogen Corporation until about the middle of August, 1921.

Q. 92. Please stop there a minute, if it will not interrupt your thought. What is the Atmospheric Nitrogen Corporation?

A. The Atmospheric Nitrogen Corporation is a corporation that was formed between the General Chemical Company and the Solvay Companies at Syracuse to exploit and put into commercial operation the General Chemical Company's process, which had been first tried out in Nitrate Plant No. 1 at Muscle Shoals.

Q. 93. And is that the plant that you speak of that was put up at Syracuse and is producing?

A. Yes.

Q. 94. So you were in a consulting capacity for this company beginning in April, 1920, did you say?

A. Yes.

Q. 95. To August, 1921?

A. Correct.

Q. 96. Now go ahead.

A. I also went abroad in the summer of 1919, again in the summer of 1920, and again in the summer of 1922, and was in England, in Belgium, France, Italy, Switzerland and Germany, and on each trip was again in consultation with many of these engineers and chemists with whom I had become acquainted earlier, and have tried to keep myself throughout the time entirely in touch with the nitrogen situation as it has developed in Europe.

I also appeared before a number of Congressional

investigating committees on the Muscle Shoals proposals of Henry Ford, on the War Expenditures, on the so-called Nitrogen Corporation, the establishment of which was proposed by the Government, going into all of those on invitation of the committees on account of my previous experience.

I have made one or two reports for compensation to other companies on the nitrogen situation, but have not acted for any one in such a consulting capacity on any question of construction or operation as I did with the Atmospheric Nitrogen Corporation.

Q. 97. Upon these trips after the war you say that you went to Germany among other places. Did you get into their fixed nitrogen plants at Oppau or Merseburg?

A. I did not.

Q. 98. Did you try to?

A. I did.

Q. 99. Pardon me?

A. I say, it was put up directly to the directors of the company and they declined to allow me to enter the plant.

Q. 100. Was there any reason assigned?

A. Yes.

MR. ANDERSON: I did not catch that.

MR. KRESEL: I asked if there was any reason assigned.

Q. 101. Just say yes or no.

MR. ANDERSON: I do not think that would be evidence. He was not doing that officially.

Q. 102. Just say yes or no.

A. Yes.

THE COURT: The question has already been answered. Is there a motion to strike out?

MR. ANDERSON: I will not object to his stating they had a reason. I presume it was a matter of

courtesy. But if we are going into the reason, then I would object.

Q. 103. Now I am going to put the question to you so that the Government can object to it. What reason was assigned to you for not allowing you to see the plants?

MR. ANDERSON: I do object to that, sir, simply because I have not the source of information for going into that question. It is purely hearsay and the gentleman was not over there as an official of the Government of the United States. I have no way of checking the situation at all, and, therefore, I do object to that question. I think it is outside of the scope of the examination.

THE COURT: What is the purpose, Mr. Kresel? Then we can tell whether it may or may not be relevant.

MR. KRESEL: Yes, your Honor, I am perfectly willing to say. The purpose is to show that the Germans declined to let any one see their process. It is material upon our contention that these patents without the know-how were valueless.

THE COURT: Is it your contention that the Haber patents assigned by the Alien Property Custodian to the defendant here were without substantial value by reason of the lack of complete disclosure?

MR. KRESEL: Certainly. Not only that, but that he did not know how to operate them, as I shall show by this witness and others.

MR. ANDERSON: If your Honor please, I do not want to argue; but suppose all that Mr. Kresel said were true, which, of course, we do not know, the question of the representative of a company engaged in the same business going into an in-

dustrial plant in another country involves many questions of delicate industrial management and organization which we can not inquire into. I imagine if we or a competitor of the General Electric Company sent somebody up to see their process at Syracuse, they would be entirely free to deny them a right to go into the plant, if they wanted to, and, therefore, the question is not what the Germans were doing in 1921 or 1922, when this gentleman was in Germany, but the sole question is as to the Haber patents agent in America and matters relating to those patents. The Germans may or may not have been doing one thing or another in 1922——

THE COURT: I can not even guess as to what the answer may be. I can see that some answers given may be without weight. I can see how possibly some other answer might have some weight. I should think the chances would be in favor of its being without weight, but that I can not tell until the answer is given. I think the answer should be taken.

MR. ANDERSON: I note an exception, sir.

A. Director Schmidt who had consulted with the directors the day previous stated that he considered my experience and knowledge such that if I went into the plant I would carry away information which they did not wish carried away, and, therefore, they must decline to let me enter.

THE COURT: Do you wish to make a motion with respect to that answer?

MR. ANDERSON: No, sir; because I could not imagine that that amounted to anything in any Court.

THE COURT: You may proceed, Mr. Kresel.

Q. 104. Have you before you what are known as the United States Haber patents?

A. I have not them here, no, but I presume they are in the room. I will get them. (Leaves stand and returns.)

Q. 105. Have you them before you?

A. I have.

Q. 106. How many are there?

A. Some fifty.

Q. 107. Can you divide them into groups, as to the different steps that they cover?

A. I think so.

Q. 108. Just tell me what groups they naturally fall into and then we will do the dividing.

A. There are a number of patents for catalysts, special catalysts. There are a few patents for the oxidation of ammonia. There are a number of patents for the production and purification of hydrogen. There are patents for the separation of ammonia after it is reduced, and then there are the main process patents having to do with the combination of nitrogen and hydrogen to form ammonia. There are numerous apparatus patents which they use in these processes.

Q. 109. I am not going to ask to you stop now and take the time of the Court to segregate those. I wish you would be prepared to do that Monday morning. In other words, in order that you might understand, I would like you to separate them into bunches, so that you can produce them and say these cover the catalyst and these cover the oxidation. Do you understand me?

A. Yes, sir.

Q. 110. In February, March and April, 1919, was there any direct synthetic ammonia plant, no matter what its particular method of production, anywhere outside of Germany?

A. When did you say?

Q. 111. February, March and April, 1919.

A. Yes.

Q. 112. Which one?

A. Plant No. 1.

Q. 113. Where?

A. At Muscle Shoals.

Q. 114. That is the Government plant?

A. The Government plant.

Q. 115. To which I shall come. Other than that there was none?

A. Except small experimental plants.

Q. 116. I know, but I was talking of production plants. Inasmuch as you have mentioned the experimental plant, where was there any experimental plant?

A. They were experimenting in England, they were experimenting in Italy, and they were experimenting most successfully in France.

Q. 117. Under the Claude process?

A. Under the Claude process. They were also experimenting in this country. There was some small experimental work going on at Niagara Falls by the Nitrogen Products Company, and I presume in other companies, but I do not know of it.

Q. 118. I read from your report, Defendant's Exhibit No. 177, the following statement: "The Haber process is not at present in use outside of Germany on account of the lack of detailed information regarding plant construction and operation, and also owing to the very large royalty demanded by the Badische Company for its use by other concerns." That was true?

A. Correct.

Q. 119. I read from page 7 of Defendant's Exhibit No. 140 the following, speaking of the direct synthetic ammonia process: "The engineering difficulties in safely handling these gases at high tempera-

tures and pressures are very considerable, and in its present state of development a much more skilled personnel is required to operate this process than either the arc or the cyanamide process. The synthetic ammonia process has been developed almost entirely in Germany, and during the latter stages of the war was the most important source of her nitrogen supply: It was not until the present year, 1921, when at Syracuse, New York, the first plant of any size outside of Germany using this process, came into regular production. Though the Government had built a synthetic plant at Sheffield, Alabama"——

Is that the same thing that you speak of as No. 1 at Muscle Shoals?

A. It is.

Q. 119. (continued) I will read that sentence again, sir: "Though the Government had built a synthetic plant at Sheffield, Alabama, during the war, it had not come into regular operation before the end of hostilities, when it was shut down. Experimental plants with only a very small production have been operated in France and Italy, and a commercial plant is now under construction in England. But the German plants up to this time have supplied all of the nitrogen fixed by this process and their capacity is so great that in a normal year they furnish more than half of the world's supply of fixed air nitrogen. The plant at Syracuse, New York, has only about one one-hundredth of their capacity and can supply less than two per cent of the total inorganic nitrogen requirements of the United States."

Doctor, at Muscle Shoals—and in order that we may not confuse the record, at Sheffield, Alabama, because I notice that this Exhibit 140 speaks of Sheffield, Alabama, as the place——

A. Sheffield, Alabama, is at Muscle Shoals.

Q. 120. Very well. The Government had built a direct synthetic ammonia plant, had it?

A. It had.

Q. 121. Which was known as Plant no. 1?

A. Right.

Q. 122. Was there any other plant?

A. There was a cyanamide plant there known as Plant No. 2, a very much larger plant.

Q. 123. This Plant No. 1, do you know who built that?

A. It was built by the Government, the Ordnance Department, in co-operation with the engineers of the General Chemical Company.

Q. 124. Was the process there followed what I have read here out of this official report as the General Chemical Process?

A. It was.

MR. KRESEL: I offer in evidence now the contract between the Government and the General Chemical Company for the construction of this Plant No. 1 at Sheffield, Alabama, found at page 2709 of the Hearings before Sub-Committee No. 5 (Ordnance) of the Select Committee on Expenditures in the War Department, House of Representatives.

MR. ANDERSON: I have not examined that paper, but subject to correction I have no objection to its going in.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 178." (*See Exhibits, Vol. V, page 3067.*)

MR. KRESEL: If your Honor will permit me to read this exhibit, it is not very long, and then we will stop.

THE COURT: Go on as long as you like and then we will stop when you are ready.

MR. KRESEL: The witness is going out of town, your Honor, and I will have to let him go very shortly. This is dated New York, June 5, 1917, and is directed to the President (reading from Defendant's Exhibit No. 178, on page 2709, down to the words, "2,000 pounds of fixed nitrogen in whatever form combined, and shall be payable quarterly").

May I stop there a minute, your Honor, to point out that the rate of royalty there provided is $5.00 for each ton of 2,000 pounds; that is, one quarter of a cent a pound; and recall to your Honor's attention the testimony of Dr. Holdermann, wherein, in arriving at his figure of $17,000,000, as the value of these patents, he said that he based it upon a supposed royalty of one cent a pound. (Continues reading of Defendant's Exhibit No. 178.)

THE COURT: Will you tell me the value that you attach to that, Mr. Kresel? I am not sure whether I understand your purpose.

MR. KRESEL: To begin with, your Honor, the value of it is to show that the process employed in the operation of plant No. 1 of the Government was the General Chemical process, and not the process of these Haber patents, which are now for adjudication before your Honor. Further testimony that will come in will also develop the importance of the stipulations in the contract with reference to future improvement. It is an agreement made by the Government as to this General Chemical or so-called American Haber process; and I think your Honor will find that in connection with the testimony that we shall introduce with regard to the report to the Government here, that it will have a very importan material bearing upon

the question of the value of these patents. I think your Honor will find that Dr. Holdermann is a little sanguine.

THE COURT: Is this a convenient point for stopping?

MR. KRESEL: Yes, your Honor.

THE COURT: We will adjourn until Monday morning at 8:30 o'clock Standard Time.

(Whereupon, at 12 o'clock Noon, an adjournment was taken until Monday, July 16, 1923, at 8:30 o'clock, A. M., Standard Time.)

TWENTY-EIGHTH DAY

Wilmington, Delaware,
July 16, 1923, at 8:30 o'clock A. M.,
Standard Time.

Before:

HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. ANDERSON: On Friday, if your Honor please, I asked leave to withdraw Plaintiff's Exhibit No. 631 for the purpose of having it photostated, it being an original record, and to substitute a photostat copy. I understand the photostat copy has been delivered to the Clerk, and I would like leave to withdraw this exhibit.

THE COURT: Leave granted.

Colonel Anderson, reflecting, since the adjourn-

ment on Saturday, upon some of the occurrences of the past week, I have become, Colonel Anderson, convinced that my ruling with respect to the testimony of Dr. Volwiler, touching the trade secrets of his company, was basically misunderstood by you. This was due undoubtedly to my failure to express clearly the principles upon which the ruling was made. Realizing that in the prosecution of this suit you are the representative of the Attorney General not only, but, so to speak, the Ambassador of the President of the United States as well, it is my purpose that in this trial you shall have not only all rights to which you may be entitled, but also every courtesy to which you and your principals are entitled that may not place the rights of others in jeopardy. To this end, and if it be your desire, I am willing not only to re-open the matter, but to permit you to have a copy of the testimony taken in chambers and to make such use thereof as you in your capacity as representative of the Attorney General and of the President of the United States believe that you are entitled to and should make.

That does not call for an answer at the present time if you do not desire to make any.

MR. ANDERSON: I wish to express my appreciation of your Honor's statement, and that matter will be considered by my associates and myself, and I will respond later.

THE COURT: That is not a suggestion.

MR. ANDERSON: I understand that.

THE COURT: I do not mean that it should have any tendency in any way to change your position if you believe that your position now is the right one.

MR. ANDERSON: I quite appreciate that, and I merely want to thank your Honor for your courtesy in making the statement.

CHARLES L. PARSONS, resumes the stand.

DIRECT EXAMINATION (Continued).

By MR. KRESEL:

Q. 125. Dr. Parsons, last Saturday I asked you to be good enough to segregate the patents into groups so that we may understand the situation a little better than we do now. Have you done that?

A. I have.

Q. 126. And have you prepared a statement or statements listing the patents in groups?

A. The statement is here.

MR. KRESEL: I will give you, Colonel Anderson, a copy of these (handing counsel statements).

XQ. 127. The first group is what?

A. The first group consists of fourteen patents on the manufacture and purification of hydrogen. I think I should add, Mr. Kresel, that in dividing these into groups it is not always possible to make the distinction absolutely sharp, as some of the patents cover more than one.

Q. 128. They over-lap.

A. We have done the best that we could.

Q. 129. You list the patents by numbers, do you?

A. List the patents by numbers.

MR. KRESEL: Your Honor, instead of putting these in evidence, may they be taken as a part of the witness's answer in the record? I think that would be more convenient for every one concerned.

MR. ANDERSON: It is perfecly agreeable to the Government.

MR. KRESEL: I will simply hand this to the stenographer to be copied in.

The first list presented by the witness covering group 1 is made a part of the witness's testimony and reads as follows:

DIVISION OF THE HABER PATENTS IN THE LIST PRESENTED BY DR. HOLDERMANN

GROUP 1—MANUFACTURE AND PURIFICATION OF HYDROGEN

(14 Patents)

1,196,101
1,102,716
1,113,096
1,113,097
1,115,776
1,126,371
1,128,804
1,133,087
1,157,669
1,200,805
1,207,968
1,286,650
1,301,151
1,330,772

Q. 130. That is Group No. 1. What is the Second Group?

A. Group of seventeen patents on the catalyst for ammonia synthesis, as follows:

GROUP 2—CATALYSTS FOR AMMONIA SYNTHESIS

971,501
999,025
1,053,951
1,053,952
1,068,966
1,068,967
1,068,968
1,068,969
1,083,585
1,094,194
1,118,628

1,128,843
1,148,570
1,149,510
1,152,930
1,158,167
1,225,755

Q. 131. That is the Second Group?

A. Yes.

Q. 132. What is the Third Group?

A. Group of six patents on processes for the synthesis of ammonia, as follows:

GROUP 3—PROCESSES FOR SYNTHESIS OF AMMONIA

1,006,206
1,202,995
1,216,059
1,243,382
1,244,580
1,386,760

Q. 133. What is the Fourth Group?

A. Group of four patents on the engineering features of process for synthesis of ammonia, as follows:

GROUP 4—PATENTS ON ENGINEERING FEATURES OF PROCESS FOR SYNTHESIS OF AMMONIA

1,075,085
1,077,034
1,086,130
1,188,530

Q. 134. What is the Fifth Group?

A. Group of six patents on the Oxidation of Ammonia as follows:

GROUP 5—PATENTS ON OXIDATION OF AMMONIA

1,094,182
1,207,706
1,207,707

1,207,708
1,211,394
1,379,387

Q. 135. What is the Sixth Group?

A. Group of eleven patents on Fertilizer and other methods of utilizing Ammonia, as follows:

GROUP 6—PATENTS ON FERTILIZER AND OTHER METHODS OF UTILIZING AMMONIA

1,063,007
1,091,234
1,106,919
1,133,086
1,173,550
1,200,806
1,211,393
1,261,900
1,274,503
1,292,019
1,369,383
1,344,673

Q. 136. Now, Doctor, have you the patents before you?

A. I have.

Q. 137. Will you produce them?

A. There is one exception, of the patent on Urea which is simply a form of fertilization, which is missing.

Q. 138. You have no copy thereof?

A. I have no copy of it with me. I have read it and am acquainted with it, but it is Patent No. 1,344,673, otherwise it is complete. It has very little bearing on the Haber situation, as I understand it.

MR. ANDERSON: What group does that belong in, please?

THE WITNESS: The last group, six, I think it is.

MR. KRESEL: Now, your Honor, these patents, there are 58 of them. They are quite voluminous, and I have been trying to find some way of having them before the Court without the necessity of printing them all. Your Honor will see that it would make a tremendous record. I wonder whether, inasmuch as they are public documents, it would not be sufficient if I offer each and all of them in evidence and have them marked, so that they will be available to the Court, with the understanding that they need not be printed *in extenso* in the record, each side, of course, being entitled to refer to any part that they desire.

MR. ANDERSON: I would suggest, with your Honor's permission, that counsel offer them in evidence, and if the Government can, after an examination of them a little more in detail, shorten the record by stipulating them in, or by any other method of including them in the record on appeal, and thus abbreviate the record, we would be very glad to do it. We would like to have, however, further time before we reach a definite statement.

MR. KNIGHT: May I suggest to your Honor that the usual course in these patent cases is to get up a patent book, in which all of the patents are bound, as separate exhibits, you might say, if it is convenient, because then they can be arranged in order of proof, and can be readily referred to. These copies can be obtained very easily from the Patent Office, and it is an easy way to do it.

THE COURT: Admitted.

MR. MAHAFFY: If the Court please, the Supreme Court of the United States, in one case,

held that that did not come within the statute, and it would have to be done by consent. I recall a number of years ago, that that was attempted to be done without the consent of the parties, and this Court declined to do it. It may be done on consent.

THE COURT: The only ruling I make now is that they may be admitted, and the other suggestion may be deferred.

MR. KRESEL: And each will have a separate exhibit number. I now offer the following patents——

THE COURT: Are all the patents enumerated by the witness in his testimony?

MR. KRESEL: Yes, by the witness. Will you mark them at your convenience? Here is a list of them.

GROUP 1. MANUFACTURE AND PURIFICATION OF HYDROGEN.

Patent No. 1,196,101, dated August 29, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 179." (*See Patent Exhibit Book.*)

Patent No. 1,102,716, dated July 7, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 180." (*See Patent Exhibit Book.*)

Patent No. 1,113,096, dated October 6, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 181." (*See Patent Exhibit Book.*)

Patent No. 1,113,097, dated October 6, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 182." (*See Patent Exhibt Book.*)

Patent No. 1,115,776, dated November 3, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 183." (*See Patent Exhibit Book.*)

Patent No. 1,126,371, dated January 26, 1915, was admitted in evidence and marked "Defendant's Exhibt No. 184." (*See Patent Exhibit Book.*)

Patent No. 1,128,804, dated February 16, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 185." (*See Patent Exhibit Book.*)

Patent No. 1,133,087, dated March 23, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 186." (*See Patent Exhibit Book.*)

Patent No. 1,157,669, dated March 26, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 187." (*See Patent Exhibit Book.*)

Patent No. 1,200,805, dated October 10, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 188." (*See Patent Exhibit Book.*)

Patent No. 1,207,968, dated December 2, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 189." (*See Patent Exhibit Book.*)

Patent No. 1,286,650, dated December 3, 1918, was admitted in evidence and marked "Defendant's Exhibit No. 190." (*See Patent Exhibit Book.*)

Patent No. 1,301,151, dated April 22, 1919, was admitted in evidence and marked "Defendant's Exhibit No. 191." (*See Patent Exhibit Book.*)

Patent No. 1,330,772, dated February 10, 1920, was admitted in evidence and marked "Defendant's Exhibit No. 192." (*See Patent Exhibit Book.*)

GROUP 2—CATALYSTS FOR AMMONIA SYNTHESIS.

Patent No. 971,501, dated September 27, 1910, was admitted in evidence and marked "Defendant's Exhibit No. 193." (*See Patent Exhibit Book.*)

Patent No. 999,025, dated July 25, 1911, was admitted in evidence and marked "Defendant's Exhibit No. 194." (*See Patent Exhibit Book.*)

Patent No. 1,053,951, dated February 18, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 195." (*See Patent Exhibit Book.*)

Patent No. 1,053,952, dated February 18, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 196." (*See Patent Exhibit Book.*)

Patent No. 1,068,966, dated July 29, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 197." (*See Patent Exhibit Book.*)

Patent No. 1,068,967, dated July 29, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 198." (*See Patent Exhibit Book.*)

Patent No. 1,068,968, dated July 29, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 199." (*See Patent Exhibit Book.*)

Patent No. 1,068,969, dated July 29, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 200." (*See Patent Exhibit Book.*)

Patent No. 1,083,585, dated January 6, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 201." (*See Patent Exhibit Book.*)

Patent No. 1,094,194, dated April 21, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 202." (*See Patent Exhibit Book.*)

Patent No. 1,118,628, dated November 24, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 203." (*See Patent Exhibit Book.*)

Patent No. 1,128,843, dated February 16, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 204." (*See Patent Exhibit Book.*)

Patent No. 1,148,570, dated August 3, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 205." (*See Patent Exhibit Book.*)

Patent No. 1,149,510, dated August 10, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 206." (*See Patent Exhibit Book.*)

Patent No. 1,152,930, dated September 7, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 207." (*See Patent Exhibit Book.*)

Patent No. 1,158,167, dated October 26, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 208." (*See Patent Exhibit Book.*)

Patent No. 1,225,755, dated May 15, 1917, was admitted in evidence and marked "Defendant's Exhibit No. 209." (*See Patent Exhibit Book.*)

GROUP 3. PROCESSES FOR SYNTHESIS OF AMMONIA.

Patent No. 1,006,206, dated October 17, 1911, was admitted in evidence and marked "Defendant's Exhibit No. 210." (*See Patent Exhibit Book.*)

Patent No. 1,202,995, dated October 31, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 211." (*See Patent Exhibit Book.*)

Patent No. 1,216,059, dated February 13, 1917, was admitted in evidence and marked "Defendant's Exhibit No. 212." (*See Patent Exhibit Book.*)

Patent No. 1,243,382, dated October 16, 1917, was admitted in evidence and marked "Defendant's Exhibit No. 213." (*See Patent Exhibit Book.*)

Patent No. 1,244,580, dated October 30, 1917, was admitted in evidence and marked "Defendan'ts Exhibit No. 214." (*See Patent Exhibit Book.*)

Patent No. 1,386,760, dated August 9, 1921, was admitted in evidence and marked "Defendant's Exhibit No. 215." (*See Patent Exhibit Book.*)

GROUP 4. PATENTS ON ENGINEERING FEATURES OF PROCESS FOR SYNTHESIS OF AMMONIA.

Patent No. 1,075,085, dated October 7, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 216." (*See Patent Exhibit Book.*)

Patent No. 1,077,034, dated October 28, 1913, was admitted in evidence and marked "Defend-

ant's Exhibit No. 217." (*See Patent Exhibit Book.*)

Patent No. 1,086,130, dated February 3, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 218." (*See Patent Exhibit Book.*)

Patent No. 1,188,530, dated June 27, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 219." (*See Patent Exhibit Book.*)

GROUP 5. PATENTS ON OXIDATION OF AMMONIA.

Patent No. 1,094,182, dated April 21, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 220." (*See Patent Exhibit Book.*)

Patent No. 1,207,706, dated December 12, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 221." (*See Patent Exhibit Book.*)

Patent No. 1,207,707, dated December 12, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 222." (*See Patent Exhibit Book.*)

Patent No. 1,207,708, dated December 12, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 223." (*See Patent Exhibit Book.*)

Patent No. 1,211,394, dated January 9, 1917, was admitted in evidence and marked "Defendant's Exhibit No. 224." (*See Patent Exhibit Book.*)

Patent No. 1,379,387, dated May 24, 1921, was admitted in evidence and marked "Defendant's Exhibit No. 225." (*See Patent Exhibit Book.*)

GROUP 6. PATENTS ON FERTILIZING AND OTHER METHODS OF UTILIZING AMMONIA.

Patent No. 1,063,007, dated May 27, 1913, was admitted in evidence and marked "Defendant's Exhibit No. 226." (*See Patent Exhibit Book.*)

Patent No. 1,091,234, dated March 24, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 227." (*See Patent Exhibit Book.*)

Patent No. 1,106,919, dated August 11, 1914, was admitted in evidence and marked "Defendant's Exhibit No. 228." (*See Patent Exhibit Book.*)

Patent No. 1,133,086, dated March 23, 1915, was admitted in evidence and marked "Defendant's Exhibit No. 229." (*See Patent Exhibit Book.*)

Patent No. 1,173,550, dated February 29, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 230." (*See Patent Exhibit Book.*)

Patent No. 1,200,806, dated October 10, 1916, was admitted in evidence and marked "Defendant's Exhibit No. 231." (*See Patent Exhibit Book.*)

Patent No. 1,211,393, dated January 9, 1917, was admitted in evidence and marked "Defendant's Exhibit No. 232." (*See Patent Exhibit Book.*)

Patent No. 1,261,900, dated April 9, 1918, was admitted in evidence and marked "Defendant's Exhibit No. 233." (*See Patent Exhibit Book.*)

Patent No. 1,274,503, dated August 6, 1918, was admitted in evidence and marked "Defend-

ant's Exhibit No. 234." (*See Patent Exhibit Book.*)

Patent No. 1,292,019, dated January 21, 1919, was admitted in evidence and marked "Defendant's Exhibit No. 235." (*See Patent Exhibit Book.*)

Patent No. 1,369,383, dated February 22, 1921, was admitted in evidence and marked "Defendant's Exhibit No. 236." (*See Patent Exhibit Book.*)

Patent No. 1,344,673, dated June 29, 1920, was admitted in evidence and marked "Defendant's Exhibit No. 237." (*See Patent Exhibit Book.*)

MR. KRESEL: I read from Page 271 of Defendant's Exhibit 140. Speaking of Plant No. 1 at Muscle Shoals at Sheffield, Alabama, this report states:

"The total gross cost of construction was $12,887,841.31. Of this amount $1,597,978.26 was for the permanent village, $503,369.43 for lands, and $198,223.26 for land improvements, roads, walks, etc. Expenses incident to operation were $710,476.12."

With reference to the result of the attempt to operate Plant No. 1, which your Honor will recall is the Sheffield plant, I read from Defendant's Exhibit 140 the following extracts: First, from page 202:

> "Owing to the Government ownership of United States Nitrate Plant No. 1, at Sheffield, Ala., designed to operate in accordance with a modified Haber process, the laboratory has devoted a very considerable amount of energy to an investigation of this process."

I might stop here to say that the laboratory is this Fixed Nitrogen Research Laboratory that is being operated by the Government.

> "The Sheffield plant was not a success, and this was partly due to insufficient technical information in connection with the various physical-chemical steps which go to make up the process."

I now read from page 8 of this same report and this is under the heading "Nitrogen Fixation Activities of United States Government":

> "In 1915 the Chief of Ordnance in his annual report called attention to the absolute dependence of this country on Chile for an adequate wartime nitrogen supply. In 1916, as a result of this recommendation and the support received from the agriculturists who appreciated the value of an increased nitrogen supply for fertilizers, Congress appropriated $20,000,000 for the development by the Government of nitrogen fixation. After extended investigations by a committee of scientists and engineers, who recommended the use of the direct synthetic ammonia process developed by the General Chemical Company, the Ordnance Department in 1917, at Sheffield, Ala., started the construction of a plant to use this process, with an annual capacity of 8,000 tons of nitrogen.
>
> "The requirements for nitrogen, however, kept increasing as the war continued; there was danger that submarines might cut off, or seriously interfere with the Chilean nitrate supply; and the ships in the nitrate fleet were urgently needed to carry supplies overseas. As a result it was decided that additional nitrogen fixation capacity was needed. In view of the emergency it was considered best not to depend on the direct synthetic process, which, though a success in

Germany, had never been used anywhere else, but to use the cyanamide process, which had been successfully operating in Canada for some six years. Late in 1917, therefore, at Muscle Shoals, Ala., using the processes of the American Cyanamide Co., construction was started on a plant with an annual capacity of 40,000 tons of nitrogen. Continually increasing requirements called for additional capacity and in 1918 plants each of half the size of the Muscle Shoals plant and almost identical with it were started at Cincinnati and Toledo, Ohio, and at the time of the armistice the necessity of still additional fixation plants was being very carefully considered."

I skip a paragraph there because it refers to some other process.

"None of these plants had come into full production before the cessation of hostilities, when they were shut down. Trial operation had shown that the Sheffield plant needed further extensive modification of equipment and process before it could be depended upon to operate regularly; the Muscle Shoals plant had operated to the extent completed very successfully; the plant at Saltville had operated with some success from a technical point of view; the other cyanamide plants were each only about a third complete, and the Navy Department plant had just been started. In all some $107,000,000 had been spent during the war by the Government in connection with its nitrogen fixation program."

MR. KNIGHT: That Navy Department plant that was referred to is the one referred to in the paragrpah that you omitted.

MR. KRESEL: Yes, I might read that paragraph.

"A plant using the cyanide process, the products of which were to be used in chemical warfare——"

Your Honor will recall that is the third process; not cyanamide—cyanide.

THE COURT: Yes, I recall that.

MR. KRESEL: (Reading):

"was also contructed at Saltville, Va., under the direction of the Bureau of Mines of the Interior Department. The Navy Department had also started late in 1918 the construction of a direct synthetic-ammonia plant at Indianhead, Md., which was to have the same capacity as the plant at Sheffield, Ala.

"In order that the synthetic-ammonia process used in the Sheffield plant might be developed to a workable basis, the War Department undertook research on several phases of the process as well as engineering re-design of much of the equipment. Recent developments, however, by private industry apparently make unnecessary any further Government activities in connection with this process other than laboratory research, and justify the United States in depending entirely on private industry for the future industrial development of this process."

I read from page 10 of this exhibit under the heading of "Present Status of Nitrogen Fixation —In the United States."

"In this country there are the two commercial fixation plants, the synthetic-ammonia plant of the Atmospheric Nitrogen Corporation at Syracuse, N. Y., with an annual capacity of 3,000 tons of nitrogen, and the arc-process plant of the American Nitrogen Products Co., near Tacoma, Wash., with an annual capacity of some 300 tons of nitrogen. There are also the two Government fixation

plants, now idle and in indefinite stand-by, the tried-out cyanamide plant at Muscle Shoals, Ala., with an annual capacity of 40,000 tons of nitrogen, and the synthetic-ammonia plant at Sheffield, Ala., which, with extensive modification of equipment, should have an annual capacity of 8,000 tons of nitrogen. There is thus an operating capacity of 3,300 tons and an idle capacity of an additional 48,000 tons. On the other hand, the present annual normal demand for inorganic nitrogen in this country over and above the 110,000 tons which can be furnished from the coking of coal is about 105,000 tons."

And on the same page under the heading of "Future of Nitrogen Fixation," I read the following:

"The nitrogen-fixation industry had such a forced growth during the war that its expansion in the immediate future will probably not be very great. Not only was this source of supply tremendously increased, but there was a considerable increase in the number of by-product coke ovens in many of the countries, including our own. With all this increased supply available, there has been a falling off in demand, due to the general world-wide economic conditions.

"The result has been a marked depression in the nitrogen industry, and many fixation plants have been unable to stand the competition of the by-product coke ovens and of Chile and have been compelled to close down. But experience has shown that the world demand for nitrogen has doubled every 10 years, and it will be only a few years until the demand catches up to the supply.

"While the fixation industry is almost marking time, so far as expansion is concerned, it is far from marking time in research and development work. Existing processes

and all their promising variants as well as entirely new processes are being carefully studied and tried out on small scale in an effort to get the process that can produce at lowest cost. This is taking place in all of the industrial countries of the world, and the United States is no exception."

Now, one more extract, your Honor, from page 30 of this Exhibit 140. Under the heading of "Government plants," the report proceeds as follows:

"During the war United States Nitrate Plant No. 1, at Sheffield, Ala., using the General Chemical Company's direct synthetic ammonia process, and United States Nitrate Plant No. 2, at Muscle Shoals, Ala., using the cyanamide process, were practically completed.

"Experimental operation was started at plant No. 1, but regular production was not secured, and considerable modification of the equipment and process would be necessary before regular production could be secured from this plant.

"Plant No. 2 was tested and showed conclusively that it could produce fixed nitrogen at its rated capacity—approximately 40,000 tons per year—at reasonable cost. Altogether, No. 2 plant produced about 600 tons of nitrogen in 1918 and about 700 tons of nitrogen in 1919."

Under the heading of "Future production from fixation plants," the report says as follows (page 31):

"If the Government plant at Muscle Shoals should be leased or sold, and be operated for the fixation of nitrogen, the domestic production of nitrogen in this country would be increased by 40,000 tons of nitrogen, equal

to a little over 40 per cent of the present nitrogen capacity of the by-product coke ovens and gas works. In order, however, for the Muscle Shoals plant to operate profitably, it is necessary not only that comparatively cheap water power be available, but also that the rental or purchase price paid for the plant be considerably less than would be determined by the present cost of reproduction. In other words, though the operation of this particular plant would be profitable under the preceding conditions, it is very unlikely that any additional cyanamide plants will be constructed in this country in the next few years unless there is a considerable change in conditions.

"It is probable that the two commercial nitrogen fixation plants already operating in this country, which supply the relatively high-priced markets for sodium nitrite and anhydrous ammonia, will continue to operate. It is entirely possible that the plant at Syracuse may be extended to supply a considerable part of the entire consumption of anhydrous ammonia in this country. Beyond that point, however, where the product of this plant would have to compete directly with the lower-priced sulphate of ammonia or nitrate of soda for fertilizer use, expansion is more doubtful. The direct synthetic ammonia process, it is true, has been able to compete successfully in Germany with Chilean nitrate, but a large part of the cost of the German plants must have been amortized during the war, and the rate of exchange has made the price of the Chilean nitrate in Germany abnormally high."

At page 271 of this report, referring to Plant No. 1, the report states as follows:

"All construction and operation activities were definitely discontinued in January, 1919. Unit No. 1, of 15,000 pounds of anhy-

drous ammonia per day capacity, was the only unit entirely completed and upon which operation was attempted."

THE COURT: That is speaking of the Sheffield Plant?

MR. KRESEL: Sheffield Plant No. 1. It had three units. Unit No. 1 was completed and upon that operation was attempted. (Reading.)

"Unit No. 2, a duplicate of No. 1, and Unit No. 3, of twice the capacity of Unit No. 1, were partially completed. Continuous operation was never realized and only a small amount of ammonia produced. Many of the difficulties of operation were overcome by changes in the process or the development of special apparatus, but others were such as to actually obstruct successful operation and to be beyond ready correction. These, however, it is believed, have been corrected in the redesign of the plant now practically completed by the Nitrate Division."

I think I should ask your Honor to bear in mind that this report was written in 1922 speaking of conditions in 1921. So when they speak of redesign of the plant they are speaking of redesign which was practically completed in 1921. (Continuing reading.)

"Although this plant was fundamentally a trial plant for the General Chemical Co.'s 'synthetic ammonia process,' to be financed from funds made available by the 'nitrate supply' section of the national defense act, the extension of the concentration project and the addition of the plant for the production of ammonium nitrate made the plant one of national defense. The financing of the construction cost of this plant, therefore, was from 'national security and defense' and 'armament of fortifications,' funds with but $53,369.43 of 'nitrate supply' funds."

Two more extracts, your Honor, and then I will be through reading. I read from page 273 of this same exhibit, speaking of the catalyst:

> "Facilities were necessary for producing the catalysts required for the conversion of the carbon monoxide to carbon dioxide and for the conversion of the hydrogen-nitrogen mixture to ammonia, and also for sodamide used in gas purification. A proposal of the General Chemical Co. that they erect a plant at one of their works and prepare this material at cost was accepted September 8, 1917. Little difficulty was encountered in making the catalyst for the carbon monoxide conversion and the sodamide, but great difficulty was experienced in making catalyst for ammonia synthesis. Much concern was felt over this fact, inasmuch as this material is vital to the success of the process, and the Nitrate Division, in July, 1918, established, through the assistance of the Department of Agriculture, an experimental station at Arlington, Va., for the study of the production of this catalyst. The best scientific talent available was called in, but due to the lack of time satisfactory results were not obtained. The problem was later turned over to the Fixed Nitrogen Research Laboratory established at the American University, the work of which is discussed elsewhere in this publication."

At page 274 I read the following extract, speaking of the redesign of this plant that the Government had in contemplation:

> "It was planned that the entire program should be completed by July 1, 1923. Construction was to be started by the summer of 1921 and completed early in 1922, leaving about one year for trial operation and development. The cost estimate for this program, including the modification of Unit No. 1, using the Haber-Bosch process, and the in-

stallation of an electrolytic hydrogen generating plant for trial of the Haber electrolytic process, was"——

I shall not read the individual items, but the total is $1,023,117.

"In view, however, of the construction and erection of a synthetic ammonia plant at Syracuse, N. Y., by the Atmospheric Nitrogen Corporation, it was deemed inadvisable for the Government to continue experimental work at Sheffield, and the Chief of the Nitrate Division recommended to the Chief of Ordnance on March 24, 1921, that the reconstruction of United States Nitrate Plant No. 1 be deferred and the plant be retained in the most economical stand-by condition. This recommendation was concurred in by the Chief of Ordnance and was approved by the President on April 30, 1921. Accordingly, the first three items only of the original program of redesign have been carried out.

"In connection with this redesign, outside engineering advice was sought whenever possible and wherever available. The general considerations in the redesign were: changes found by experience in the operation of the Sheffield plant to be absolutely necessary before operation could be attempted; changes indicated by general engineering practice to be fundamentally necessary before successful operation could be hoped for; basic changes in the process, especially the substitution of electrolytic production of hydrogen for the present method and apparatus installed."

Mr. Anderson: May it please the Court, in order to avoid interrupting the examination by any objection, I would like at this time to make the position of the Government clear by a combined motion to strike out any objections to tes-

timony of a certain character, and ask, if it can be done, that it be applied to each and every question applicable thereto—that is, which comes within the class named—in addition to the general objections to this evidence.

We object and move to strike out the testimony just read and all similar testimony in the case, and to strike out each and every question and answer in the evidence heretofore taken, and object to each and every question and answer in the evidence heretofore taken which tends to impeach or affect the complete validity of the patents involved in this controversy, and their usefulness in all respects for the purposes for which they are intended.

As grounds for that motion, applying——

THE COURT: You may put your grounds of record, but I think I understand you, Colonel.

MR. ANDERSON: Yes, I thought I would just state them without arguing.

As to the evidence just read, it was two years subsequent to the sale, and therefore could not have affected the question. And that would apply to all evidence of reports of transactions subsequent to the date of the sale. That is one. Second, that the defendant is estopped to raise any question of the validity or full usefulness of these patents first by the fact that it purchased the same of the Government of the United States and took title thereto, second by the fact that it has by its charter obligated itself to defend and protect that title according to its own construction of the charter on this record, third by the fact that it has licensed these patents and claims to have licensed them for the Government of the United States, and to various producers and users of the product in question, and therefore can not question the va-

lidity thereof or the extent of use thereof. But the defendant is estopped by the acts of its own officers. That is throughout this record, and at various times they have asserted the validity, use and complete value of these patents.

We rely upon all of those points and generally upon the law of estoppel as applied to the record in this case. I do not know that it would be necessary to raise that question by objection, but under the method we are proceeding in this case it has seemed to me proper and perhaps an appropriate act that we should present that question to the Court at this time, to the end that no question may be raised as to our frankness in stating it during the proceeding. I should have added one other matter, if your Honor please, and that is when I spoke of acts *in pais* perhaps I should have specified that as to a large number of these patents suits have been instituted by the defendant in the United States Courts, including this Court, against the Treasurer of the United States, among others, in which they have asserted as a necessary basis for the maintenance of the suit the validity and full compliance with the law as to all these patents. There is the further position which my associate reminds me of, which is a conclusion of law from those facts—that they can not attack them collaterally, and this is a collateral attack.

Those are the chief grounds, but I reserve the right on the matter of estoppel to object at any time on any grounds I deem proper, on the record.

Mr. Kresel: I do not think, sir, I want to argue the question at this time.

The Court: May I ask you this without inviting an argument; that is, whether you acquiesce

in the position taken by the Government with respect to the validity of the patents or whether your views are in conflict with those expressed by Colonel Anderson?

MR. KRESEL: To begin with, your Honor, we have made no attack upon the validity of these patents that we are now discussing. Secondly, the suits that have been instituted, to which counsel refers, are suits to recover royalties earned under licenses issued by the Federal Trade Commission and not by this defendant. The question of the validity of the patents there is not in issue by us.

As long as I am speaking on the subject I must say that it is rather a novel proposition that a purchaser, even if we were contesting the validity of the patents, may not contest the validity of a patent because he bought from the United States Government. But, as I say to your Honor, what we are proceeding to show is the value of these patents and the basis upon which these witnesses whom we are calling are going to give their opinions as to the value of the patents, and in that value and upon the question of that value the various elements which I have read from the official report and brought out by the witness enter.

Q. 139. Dr. Parsons, in one of these extracts the term "anhydrous ammonia" was used. Will you please define that to us?

A. It is the pure gas, or the pure gas liquefied, generally the latter, containing no water. The word "anhydrous" means without water. Most ammonia that comes into commerce is simply the gas dissolved in water to the extent of about 25 to 26½ per cent. That ammonia gas under pressure alone at ordinary temperatures or aided by increased temperature can be itself obtained and utilized in the form of a liquid and is so utilized to a large extent in commerce.

Q. 140. Dr. Parsons, in February, March and April of 1919, was it possible for any one in the United States skilled in the art to manufacture ammonia by simply following the processes described in these patents that have been this morning put in evidence?

MR. ANDERSON: I have to note an objection to that, sir, because it calls for a conclusion.

THE COURT: I am wondering how we will get at that fact, Colonel Anderson, if not by that question. I assume it calls for a negative answer; and just at the moment I do not happen to think of any way in which it could be done. I therefore overrule the objection.

A. It was not; nor in any other country except Germany.

Q. 141. I read from your report made to the War Department, Defendant's Exhibit No. 176, the following statement at page 10: "The technical control of the Haber process"—and when you speak of the Haber process at that point, what process are you referring to?

A. The German Haber process.

Q. 142. "The Technical control of the Haber process is of such great importance and requires so high a degree of training and skill that it is reported that if the Badische people were to lose their present technical staff of experts familiar with the process, many months would be required to train another staff capable of applying them."

I read the following extract under the caption, "Disadvantages of the German Haber process," where you say this:

"(1) Inability to procure technical details, use of methods and a trained technical force without the assistance of the Badische Company, except as the result of many months and probably years of experimentation. This is largely owing

to the difficult engineering problems involved in the use of pressures as high as 150 atmospheres and temperatures of 500 degrees to 600 degrees Centigrade."

You made these statements?

A. I did.

Q. 143. To the War Department?

A. Yes.

Q. 144. And they are true?

A. They were true then and are today.

Q. 145. In the months of February, March and April, 1919, as I understood your testimony, the only plant in the United States using a synthetic ammonia process was Plant No. 1 at Sheffield, Ala., which was not producing?

A. That is correct. I would like to modify that. Any commercial plant. There were one or two small experimental plants making perhaps a few pounds a day.

Q. 146. You told us that on Saturday?

A. I should say laboratory installations rather than a plant. It was simply done in the laboratory.

Q. 147. Do you know, Dr. Parsons, whether in February, March and April, 1919, anybody in the United States had succeeded in making the German catalyst?

A. They had not, to the best of my knowledge and belief.

By MR. ANDERSON:

Q. 148. The question was, did you know?

A. They had not.

MR. ANDERSON: That still does not answer the question, if your Honor please. The question is does he know. He says to the best of his knowledge and belief. Does he know what everybody in the United States has been doing in making a catalyst?

THE COURT: Let us have the question again.

(Q. 147 repeated as recorded above.)

A. I think I better adhere to my original answer.

THE COURT: I think probably you did not understand Colonel Anderson's objection.

MR. KRESEL: May I withdraw the question and reframe it, sir?

THE COURT: And strike out the answer?

MR. KRESEL: If there has been an answer, of course, the answer may go out.

THE COURT: I do not think you will be able to escape putting the question. Whether you want to withdraw it or not, is for you to determine. But I imagine you would have to put it again before you can ask another question. You may exercise your option.

THE COURT: The objection, Dr. Parsons, is this, that before you may state what the result of your knowledge is, whether that knowledge is affirmative or negative, you must state whether you have such knowledge and then you may state what the result of that knowledge is. The question is whether you know certain information. The answer is yes or no, or yes or no modified. Won't you repeat the question again, please, Mr. Stenographer?

(Q. 147 repeated as recorded above.)

A. I shall have to answer that no, with modifications, if I may add them.

THE COURT: You may.

A. (continued). I had made every effort to find out throughout the United States and throughout Europe as to whether or not it was possible or whether any individual had the slightest knowledge of how to make the German catalyst. I found none or any indication that that knowledge existed outside of Germany.

By Mr. Kresel:

Q. 149. Dr. Parsons, on your visit abroad, did you endeavor to find out anything about the German catalyst?

A. I made every possible effort to find it out. The nearest I came to it was from a German engineer whom I met in Guttenberg, and there in connection with his advice I secured a small piece of reduced iron with a statement of the process which was used to produce it, which they claimed had been used as a Haber catalyst. I brought that iron with me to America, but it afterwards turned out that it probably had no connection with the Haber process whatsoever.

Q. 150. Do you know of efforts made in other countries other than the United States, and outside of Germany, for the working of these Haber patents?

A. I know of many.

Q. 151. In what countries?

A. In England, in France, and in Italy.

Q. 152. Do you know whether in France they have been able to produce under the Haber patents?

Mr. Anderson: I shall object on the ground that it is pure hearsay. We can not go into the French situation without calling witnesses from France.

Mr. Kresel: I think, sir, I will be able to support that with documentary proof, if your Honor will permit the witness to answer.

The Court: But documentary proof would be open to the same objection that is now made if this objection is valid, would it not?

Mr. Kresel: I assume so, your Honor. I do not see any escape from that.

The Court: I am confronted with the same difficulty as with the prior objection. I do not know just how the negative, if it be a negative,

can be established save in this way, unless we call——

Mr. Anderson: May I suggest, if your Honor please, that even if there is no other way to establish a negative, to establish it by hearsay and from purely hearsay information would not be justified; because it might be desirable for the plaintiff to establish the affirmative, and how could the plaintiff establish an affirmative of something existing in France as to which this gentleman had been told? If there is any direct information of anybody who has experimented in France or any legal evidence of conditions existing anywhere, of course, subject to the general objections which we have already indicated, the evidence would go in. But I do not understand that hearsay evidence, what some people told him, may be received. Take the last answer in regard to the German scientist he met at Guttenberg. Who was he? He doesn't know. He told him something that somebody else told him, that somebody else told him, about a piece of iron; and then he found out it wasn't so at all.

The Court: I think you misunderstood the answer, Colonel Anderson. But I do not see how the answer to this question, if presented through the leading French scientists, would be any less hearsay, save with respect to his own experiments, than would be the answer of this witness. He has shown an effort to find out in France the facts with respect to which he is now testifying. The only difference that I can see in the question would be as to whether he was able to discover it in France, rather than whether France had developed it. But for practical purposes, it is the same thing, because his answer would be limited.

Mr. Kresel: May I call your Honor's atten-

tion to the fact that in Dr. Holdermann's testimony he testified about the efforts of the French to develop the Haber process. Your Honor will recall he testified that the French had paid to the Badische German Company a large amount of money for information as to how to operate under the patents, although the patents were available to them. I propose now to introduce the contract between the Badische Company and the French Government, whereby the French Government paid the Badische Company millions of francs for the knowledge of how to operate under these Haber patents.

Mr. Anderson: If your Honor please, your Honor will recall undoubtedly, because it was interesting in developing the examination of Dr. Holdermann, that while I confined the direct examination to value, counsel went into all collateral questions and I gave notice on the record, in accordance with the practice in some Courts—I do not know whether it is here—that he was thereby making the witness his own witness. Not a word was said on direct about any French contract. I never asked about it. It was brought out by counsel by question of his own from that witness.

I do not know how far the rule would be applied, but when counsel introduces evidence of the witness either on direct examination of his own witness or on cross-examination outside of the direct, it seems to me that it is a remarkable procedure for him to then come in and ask leave to contradict that evidence.

Mr. Kresel: I am not contradicting it. I am putting evidence in to support that testimony.

The Court: I have reflected a great deal upon the cross-examination of Dr. Holdermann. I had an opportunity to do that before the trial began.

And each time that I consider it, I am more thoroughly convinced that the cross-examination was not only thorough and complete, but also proper; that the moment that Dr. Holdermann testified to the value of these patents, he was subject to all cross-examination which would tend to show a lesser value. Apart from the question of credibility, the cross-examination as I still see it did not go beyond the bounds of proper cross-examination; and for the reasons indicated a moment ago, I overrule the objection to the question now put.

MR. ANDERSON: Your Honor will permit an exception, of course.

A. They have not, according to the information I obtained from the French engineers and scientists, obtained from them direct, in person.

MR. KRESEL: I now offer in evidence the Official Report——

THE COURT: Lest there be a misunderstanding, I understand that answer and its value is this: The same as if he put it in these words, and no other effect—I was unable to discover in my investigations in France any use that the French had been able to make of them.

That is the legal interpretation I put upon it.

Q. 153. And is that the substance of what you meant to convey by the last answer?

A. Certainly.

MR. KRESEL: I now offer in evidence the Official Report and proceedings of the Chamber of Deputies, of the Twelfth Legislature of the Republic of France, the Extra Session 1922, which is a supplement to the Report of the First Meeting of December 6, 1922, consisting of a report made in the name of the Finance Commission in charge of examining the law in regard to approving and

making an agreement on the manufacture of Synthetic Ammonia, between the Republic of France, and the Badische Anilin und Soda-Fabrik of Germany. The original, your Honor, is, of course, in French, but I have had a translation made of so much of the proceedings as refer to this particular contract, and have had the contract translated, and it is here contained. I offer both the original and the translation. The copy starts there (indicating).

MR. ANDERSON: How is it verified?

MR. KRESEL: Verified by the print of the Chamber of Deputies of France.

THE COURT: They are both admitted, and if there is a difference in the translation, it may be corrected, unless the difference is so great as to require the putting in evidence of the plaintiff's own translation, and if that is desired, either method may be adopted by the plaintiff.

The contract was received in evidence and marked "Defendant's Exhibit No. 238." (*French text not printed.*)

The translation was received in evidence and marked "Defendant's Exhibit No. 238-A." (*See Exhibits, Vol. V, page 3072.*)

MR. KRESEL: Now while you are marking the exhibits, I desire to read the following extracts from the contract.

MR. ANDERSON: One minute, if the Court please, without at this time arguing on any ruling, I want to reserve on the record my objection to the introduction of this document, on the ground that it is not properly verified or proven for introduction in a Court of the United States. I do not think the Government should determine at this time, whether I shall insist upon that objection,

because I have never read the document, but I think it is my duty to reserve the point.

THE COURT: But is not the nature of that objection such that unless passed on and determined now, that the defendant may be taken by surprise?

MR. ANDERSON: Certainly, unless I did within a reasonable time, while the trial was in progress, insist upon the objection. I think your Honor's suggestion is entirely appropriate; but I have not had a chance to examine the document, and I would not like to suspend the proceedings.

THE COURT: Then, your objection falls at the conclusion of the session.

MR. ANDERSON: Then unless I have notified counsel and the Court that I shall insist upon this objection before the evidence is closed, so as to give counsel an opportunity to remedy it, then, of course, the objection will be deemed to be abandoned. I merely want to reserve the right, so that I may examine the document.

MR. KRESEL: That is agreeable. This your Honor, I read——

THE COURT: Won't you tell me again, Mr. Kresel, what this particular document is, before you begin to read it?

MR. KRESEL: Yes, your Honor, certainly, I shall be glad to. This is a contract between the Republic of France——

THE COURT: Referred to by Dr. Holdermann?

MR. KRESEL: Yes, your Honor.

THE COURT: All right.

MR. KRESEL: But before I read extracts from the contract, I read the following from the Report of Deputy Mr. Charles Leboucq. It is entitled:

"THE AGREEMENT OF NOVEMBER 11, 1919.

"Now that we know the reciprocal merits

of several processes for the manufacture of Ammonia, we will be able to examine the advantages of the agreement passed on November 11, 1919, between the State of France and the Badische Anilin.

"About June, 1919, immediately after signing the treaty with Germany, having learned that the latter had been able to continue the war thanks to the Haber process and thanks to the possibility of producing Synthetic Ammonia, we have negotiated for the purchase of this process for France. I had requested and have obtained an option. My honorable successor, Mr. Andre Lefevre, has taken up this option and I congratulate him on it.

"In these terms, Mr. Laucheur recalled to the Chamber, during the course of the first meeting on July 3, 1920, under what circumstances the Ministry of Industrial Reconstruction has been led to consider the production of the Badische. Article 297 of the Treaty of Versailles reserves for the Allied Powers, the right to sequester and liquidate all the property, rights and interests belonging to the Germans. The Badische had taken out several patents in France to protect its processes; the State of France then had the right to liquidate these patents and processes.

"England and the United States, who during the war had attempted in vain to develop the processes other than the German process, have hastened since the Armistice, to get possession of the Haber patents and cede them to private companies.

"France was not content to get possession of them. Estimating that the very delicate and special technique developed at Oppau and Mersebourg could not be acquired by the French engineers, France attempted to treat with the Badische to obtain its technical cooperation for the purpose of exploiting the Haber patents.

"The contract passed on November 11, 1919, bears on behalf of the Germans, the signature of Mr. Bosch, Director of the plant, who participated in the negotiations at the Treaty of Versailles, and on behalf of the French, the signature of Mr. Patart.

"Article 13 provides that France 'can within a period of three months from the date of the contract, renounce the rights and obligations resulting therefrom. After this period of time has expired, the contract will be carried out in full.' The period of refusal expired, therefore, on February 11, 1920. On the 22nd of June following, the question of the legality of approving the agreement was filed. In the interval a prorogation had been obtained until April 1, 1920."

This is the text of the contract:

"CONTRACT BETWEEN THE STATE OF FRANCE AND THE BADISCHE ANILIN AND SODA FABRIK, A. G.

"The Transfer of a Process for the Manufacture of Synthetic Ammonia.

"Between the Ministry of Industrial Reconstruction, acting in the name of and in behalf of the State of France and designated in the following as 'the State of France,' and represented by Mr. Patart, Director of Powder, party of the first part, and the Badische Anilin and Soda Fabrik Aktiengesellschaft, joint stock company of Germany with a capital of Ninety Million Marks (90,000,000 M.), which is located at Ludwigshafen on the Rhein, designated in the following by the four initials, B. A. S. F., represented by Messrs. Professor Bosch, President of the Council of Administration, and Allbrecht, Attorney for the Company, duly appointed in conformance with the German law; it has been declared and agreed as follows:

"DECLARATION

"The B. A. S. F. possesses for the production of Synthetic Ammonia, certain processes used in the plants at Oppau and Mersebourg. In order to protect these processes, the B. A. S. F. has taken out certain patents in France. The State of France, desiring to apply and exploit in France the above-mentioned patents and processes, has judged it to be to their advantage to obtain the voluntary co-operation of the B. A. S. F., to this end, in matters regarding the application of the above patents and processes, such as the technique, the technical secrets necessary or useful in the manufacture or exploitation, and the use of recent improvements and investigations without in any way impairing the rights which the French State obtained on patents and processes examined under the Treaty of Peace signed June 22, 1919, and without making the State of France in any way abandon all or any part of these rights.

"In consequence, the State of France and the B. A. S. F. has agreed as follows:

"ARTICLE I

"The B. A. S. F. agrees in a general way to provide the French State, under the forms and conditions which will be stipulated hereinafter in the present contract, all the explanations and detailed information necessary or useful for operating all the processes used in the plants at Oppau and Mersebourg, for the production of Synthetic Ammonia and for the transformation of this product into Ammonia Sulphate and Nitrates of Ammonia, as well as all the details for the installations necessary to their production, the results obtained and the improvements under investigation." * * * *

It is quite lengthy, your Honor, and by skip-

ping some of it, it does not mean that I do not desire to read it, but I do not want to take the time, so I shall read only certain portions.

I read now from Article III:

"The present contract implies the total and exclusive ceding to the State of France, of all the French patents taken out in France and bearing on the manufacture of the products enumerated in Article I. The ceding will be legalized at the request of the French State and at its expense, and will comprise the exclusive license for using the above patents.

"The two contracting parties agree to let each other have the benefit of any improvements which they make during the duration of the contract for the above processes.

"In particular, the B. A. S. F. will give to the French State, the French Colonies and the countries under the protectorate of France, exclusive license for all additional patents or improvements which they are able to take out in the future relating to the processes mentioned in the first article.

"But, the B. A. S. F. alone will retain ownership of the patents for articles other than those which are made the object of the present contract; she will not take up, however, any question on the validity of these patents or on their duration.

"ARTICLE IV

"The B. A. S. F. will give over to the French State as quickly as they will be needed, the plans in general and in detail, for a plant capable of fixing in the form of Ammonia solution, 100 tons of Nitrogen per day of twenty-four hours, as well as all the necessary information concerning the construction, operation and maintenance. In addition it will place at the disposal of the State of France, all the installation and organization

pertaining directly or indirectly to the manufacture of the products enumerated in Article I, or anything which is indispensable to the preparation of the raw materials or intermediate products used in obtaining them. This information will comprise especially, process books and detailed lists of pieces of apparatus; plans of foundations, the system of piping, means of communication, all installation and apparatus for control, measurement and safety, necessary or useful for the perfect operation of the complete plant.

"The B. A. S. F. will inform the State of France in every particular concerning detailed measurements, precautions to be taken to avoid accidents, to obtain the best yields and the best quality, and it will also give information on the most advantageous method of operation.

"From the time that the present contract takes effect under the conditions specified in Article 13, the French State must proceed, either directly or indirectly (through individuals or companies), with the construction of a plant capable of producing as indicated above.

"ARTICLE V

"The B. A. S. F. will make known in a precise and detailed way, the results to be expected at each stage of the operation, including the thermal, chemical and mechanical yields of each operation and of each machine and piece of apparatus and of every operation which is concerned in the manufacture. It guarantees positively, the results obtained in its own plants under continuous operation, such as are set forth in the figures contained in Supplement No. 13, and it is expressly stipulated that the present contract is passed on the basis of this guarantee.

"The B. A. S. F. also guarantees the authenticity of a detailed and complete dia-

gram for the installations to be made; this diagram constitutes Supplement No. 2, included in the present contract.

"ARTICLE VI

"The State of France agrees expressly, not to divulge the processes which are the object of this contract. It will bind all the employees to the strictest secrecy by obtaining the signature of these employees, including all delegates and representatives who have any knowledge of the process as a whole or in part, and who before being employed, will be obliged, under penalty of the law, to keep secret all the manufacturing processes of which they have any knowledge, and in case of dismissal, will be obliged not to give their co-operation, either directly or indirectly, to any similar industry carried on in France or abroad for the length of time determined upon.

"This condition will remain in force during the duration of the present contract and fifteen years after its expiration.

"ARTICLE VII

"The B. A. S. F. agrees to give to the State of France, in every possible way, its advice and its aid in the setting up of all construction and installation for a plant capable of fixing 100 tons of Nitrogen per day, under the conditions specified in the above article, as well as aid in the control of the construction and putting into operation. To this end it will send the necessary personnel to supervise construction and operation during construction, until the production and yields indicated in the present contract and supplements have been attained during a period of fifteen consecutive days. The State of France will reimburse the B. A. S. F. for the traveling and living expenses of the above-mentioned

personnel while in France, but the salaries of this personnel will remain in charge of the B. A. S. F., since it may be considered that they are included in the sum paid to the B. A. S. F. in remuneration for its co-operation.

"Article VIII

"Until the previously announced results have been attained in continuous operation, the employees or agents of the State of France will have free access at all times to the plants of the B. A. S. F. where the processes of the present agreement are carried on; all facilities will be given to these employees or agents to learn in the plants of the B. A. S. F. all details for operating the above processes, for operating the apparatus and for applying the methods of analysis, control, measuring and safety.

"The same will hold throughout the duration of the contract whenever certain improvements are made on the process, or in case of necessity, by agreement between the contracting parties.

"Article IX

"The B. A. S. F. will furnish directly without profit to itself, all machines and all apparatus which it will be advantageous to keep secret in the interest of both parties, or all such apparatus as can not conveniently be constructed by any other place than the shops or sources of supply of the B. A. S. F. In both cases the B. A. S. F. will bill the French State for the apparatus specified above, either at the cost price or purchase price. It is agreed that the cost price will be established by adding to the cost of materials and labor an additional charge of 10% for general expenses and amortization, and it is agreed that the purchase price will be determined by adding to the sum actually paid to the Supply

House, an additional charge of 5% to cover expenses of administration. In case the B. A. S. F. is not able to furnish the apparatus in question, it will indicate the source of supply to the State of France and will act as intermediary, if so desired, in order that the purchase will be concluded under the best conditions.

"It is agreed that for the apparatus which the State of France will order for the French plants, either for the first installation planned or in case of further enlargement, it will oblige its constructors not to divulge any of the secrets of construction which the B. A. S. F. has given them and not to deliver this apparatus except to the State of France, unless by agreement with the B. A. S. F.

"The B. A. S. F. will guarantee good quality and will give assurance for perfect operation of all the apparatus which it will supply or the construction of which it has controlled or which has been bought in accordance with its diagrams and specifications. It will bear no responsibility for those which do not satisfy these last conditions.

"ARTICLE X

"In remuneration for the voluntary cooperation furnished by the B. A. S. F., under the conditions specified in the present contract, for putting into operation its processes, the B. A. S. F. will receive from the State of France:

"1. A fixed sum of Five Million Francs (5,000,000 Fr.), payable as follows:

"Two Million Five Hundred Thousand Francs (2,500,000 Fr.) as soon as the present agreement becomes effective, in accordance with the stipulations of Article 13, and——

"Two Million Five Hundred Thousand Francs (2,500,000 Fr.) when the plant or plants installed in France are producing in

continuous operation per day of twenty-four hours for a period of two weeks, a minimum of twenty tons of Nitrogen in the form of Ammonia solution.

"2. A royalty per kilo of Nitrogen contained in Ammonia solution produced in the high pressure plant, this royalty being fixed at twelve centimes (12 c.) if the average price for the unit of Nitrogen (a kilo) contained in Chilean Nitrate of Soda delivered c. i. f. at a French Port, remains equal to or above six francs during the period under consideration (one-half year); it will be lowered to ten centimes (10 c.) if the average price of the unit of Nitrogen is between six francs and three francs or will become eight centimes if this average price is between three francs and two francs, and five centimes, if the average price is below two francs. This royalty will be due from the time that the first plant is put into operation and from that moment on when the production of thirty tons of Nitrogen in the form of Ammonia, per day of twenty-four hours, will have been attained. The annual royalty will not be less than 500,000 francs, whatever the production, even if it is nothing; this minimum will be increased to One Million francs, from the time that a production of sixty tons per day of twenty-four hours has been attained. This royalty will cease to be paid upon expiration of the fifteenth year, counting from the day when the production of thirty tons will have been obtained."

As I say your Honor, the thing is quite lengthy, and I think I have read the essential portions.

Mr. Anderson: May I ask, Mr. Kresel, if the matter included at the end of it is also introduced? It was not clear to me. Of course, I have not seen the original. I only want to know for my

information, because there was a lot of stuff included at the end, apparently discussion, beginning page 14. I have not seen the original. I do not know what relation that has to the contents.

MR. KRESEL: Why, that is the balance of the report.

MR. ANDERSON: I merely ask for information. I have made my objections and they apply to all of it.

MR. KRESEL: I desire to include that.

MR. ANDERSON: All right.

Q. 154. Dr. Parsons, do you know Colonel Joyes?

A. I do.

Q. 155. Tell us what Colonel Joyes's connection with fixation of nitrogen during the war was?

A. Colonel Joyes was an officer of the Ordnance Department who was put in charge of Division T, known as the Nitrate Division of the Ordnance Department, shortly after the signing of a contract, or the making of arrangements with the General Chemical Company, I think in June, 1917; and he stayed in control of the work of the Ordnance Department for the construction and operation of nitrogen fixation plants until the war was over.

Q. 156. When you speak of the arrangement with the General Chemical Company what arrangement are you referring to?

A. The plant at Sheffield, Alabama.

MR. KRESEL: I now offer in evidence a report by Colonel J. W. Joyes, Ordnance Department, United States Army, found at page 107 of the book on the Hearings before the Committee on Military Affairs of the House of Representatives on H. R. 10,329.

MR. ANDERSON: I have no objection.

THE COURT: Admitted.

Received in evidence and marked "Defend-

ant's Exhibit No. 239." (*See Exhibits, Vol. V, page 3225.*)

MR. ANDERSON: Mr. Kresel, what was the date of that hearing, please?

MR. KRESEL: April 19, 1920.

MR. ANDERSON: What is the date of the report?

MR. KRESEL: The report is not dated.

May I direct your Honor's attention to another paragraph in this French agreement, with reference to secrecy. It says:

> "This condition will remain in force during the duration of the present contract and fifteen years after its expiration."

I now desire to read from the report of Colonel Joyes. The two opening paragraphs are as follows:

> "This statement is intended briefly to present some of the information obtained and opinions formed by me during an official visit to Europe in the summer of 1919, especially bearing upon the plant development and costs of production of the cyanamid process and of the Haber synthetic ammonia process."

Q. 157. Dr. Parsons, do you know when Colonel Joyes made this trip?

A. My recollection is that it was in the spring of 1919. He went with Colonel White and other officers, Major Tour, Colonel Wagner, and Colonel Lamb, to Europe to study the situation, and visited the plant at Oppau.

MR. KRESEL: (Reading):

> "This visit to Europe was made as Chairman and member of the United States fixed nitrogen commission appointed by the United States fixed nitrogen administrator with the

approval of the Secretary of War, to ascertain the state of the art of nitrogen fixation in Europe, and especially in the occupied German territory. The commission spent about two months abroad visiting several cyanamid and ammonia oxidizing plants in France and Germany and the noted Haber plant of the Badische Co. at Oppau for the synthetic manufacture of ammonia. The large arc plant in Norway was also visited and many well-informed persons were interviewed.

"In the need for nitrogen for the war Germany was pressed hardest, because all importation of Chile saltpeter was stopped by the blockade, and munitions could not be made without a substitute material from which nitric acid could be produced.

"The German Government nitrogen administrator required the gas works and coke works to deliver all possible by-product ammonia, but no great increase could thus be made.

"The Government further increased ammonia production by requiring increases of existing cyanamid plants and construction of new ones, the Government assisting by large loans, etc., and even building out of public funds two large cyanamid plants.

"The Haber synthetic ammonia plant which the Badische Co. had started to build at Oppau in 1912 had brought into successful operation just before the war its first installment, some 7,000 tons per year. Later this plant was increased to 100,000 tons per year; and another plant for 200,000 tons per year was built at Merseberg, some three-quarters of its capacity having been developed when the Armistice was signed.

"France undertook the establishment of plants to produce by fixation at home nitrogen substitutes for Chile nitrate sufficient in amount for all her home munitions manufacture.

"The process selected as the backbone of this program was the cyanamid process, and the plans contemplated adding to the pre-war capacity (which was about 8,000 tons of nitrogen per annum), an aggregate annual production of over 50,000 tons of contained nitrogen, giving in all some 60,000 tons of nitrogen —to be available a small part before 1918, part in 1918, and all by May, 1919."

The report then goes on to indicate what other countries did, which I shall not read now.

"In Germany and in France the need was so great that some of the plants were placed where conditions were so unfavorable that it was never expected that they could live after the war, but as far as possible they were placed and built with a view to future use in production for the needs of agriculture and the arts.

"The Haber process is a new process, and large scale use brought many troubles, which under the war pressure the large and efficient staff of the B. A. S. F. succeeded in overcoming, so that the process is now a continuously operating and fairly efficient plant to which the German company has linked up many auxiliary processes for adapting its ammonia to fertilizer uses. But our inspection indicated to us that up to the close of operation of the Oppau plant there had been constant modification and improvement of apparatus. Only a single ammonia converter at Oppau had all the latest improvements that we saw. It seemed clear to us that the Oppau plant showed need of still further improvement for entirely satisfactory operation.

"At a good many points quite careful regulation of pressures, quantities, temperatures and composition of the gas mixture, and a great number of gauges, meters, indicators, thermometers, etc., were provided to show the need for control by manipulation of a cor-

respondingly large number of valves, switches, and the like.

"It is said that fewer operatives are required than would be indicated by these controls, but making every allowance therefor, our commission was convinced that the labor and supervision forces must be quite large. In the estimates which have come from a number of sources the expense of this item was not exorbitant, because of the very low salaries and wages paid in Germany up to 1914, and it is upon such low rates, now no longer existent even in Germany, that the production of ammonia at quite low figures had been asserted.

"Repairs and upkeep must be expensive.

"It has been said that ammonia was made in this plant when it first started operation (1914-15) for about 4 cents per pound, exclusive of interest and with a small item of depreciation only, but it must be remembered that at that time lignite for fuel was available at about $2 per ton and coke at about $4; that common labor received about 75 cents to $1 per day, and skilled labor between $1.40 and $1.50. These conditions have gone, and are not expected to return.

"It was our firm conviction that under present conditions the production cost must be fully two and a half times as much."

Then Colonel Joyes proceeds to state as follows—and I direct your Honor's particular attention to this:

"If we assume this same plant" (that is, the German plant) "set down in perfect condition in a favorable location in the United States, the costs of production under present price conditions would be, in my opinion, based upon our careful studies, as follows."

And then he gives a list of items and comes to the conclusion that the aggregate cost per

pound of ammonia would be between 15.5 cents and 12.9 cents.

Further on, Colonel Joyes, still speaking of what it cost to operate by the German-Haber process, says this:

> "We have no basis for absolute comparison in the United States, since the Government's plant, experimentally built to use a similar but only partly developed process, promptly developed troubles, and the close of the war coming just at that time prevented the expenditure of the money necessary to overcome those troubles and make the plant operate. If the war had continued that would undoubtedly have been done, and the plant would have been made to make ammonia. But the experience showed conclusivly that there would have had to be much development at much expense before the new American process could have equalled or nearly equalled the German or Haber process, which had had already eight years or so of intensive study in commercial, if small-scale, apparatus, and several years of large-scale operation.
>
> "There is nothing to indicate that the Haber or similar process in its present state of development can, under present business conditions in America, produce ammonia for as low a price as 10 cents per pound, exclusive of interest."

And we shall show your Honor what the prices are by the other processes.

> "As I have already stated the matter of nitrogen supply was, during the war, energetically fostered by the German Government, and specific control over all matters in that connection was exercised by an imperial commissioner or commissary for nitrogen control under the War Department, who was given authority to issue regulations for the produc-

tion and use of nitrogen products and for all traffic therein. In several publications the establishment of this control is mentioned in terms of high praise, and Walter Rathenau, in general charge of raw materials supplies, was given great praise for having initiated it.

"In order to know the conditions affecting production by the several groups there were associated with this Government administrator,"

Certain people whose names I shall not mention.

"This designation"—that is, the designation of Stickstoff Syndakat G. m. b. H. or nitrogen syndicate; that is the way the consolidation was known.

"This designation is a commercial one and the organization is along commercial lines, but it is reliably stated that the establishment of this syndicate was largely due to governmental influence. This will be more easily understood if it be realized that the German Government had given financial assistance to many of the new plants and plant increases which the war had necessitated, and that it had also built, out of public funds, two of the largest cyanamid plants in Germany.

"In order to safeguard other interests than those of the producer and to insure economy in distribution, there has at the instigation of the Government finance ministry been organized a joint body consisting of representatives of producers and consumers known as the nitrogen commission. That commission will consist of 23 members; the nitrogen syndicate just mentioned, the Government, and representatives of the agriculturalists of Germany will have 5 members each, and fertilizer manufacturers, fertilizer dealers, the Bureau of Industry, and the

Bureau of Agriculture, and three of the associate States, will have one member each.

"This information, which comes from most reliable sources and is not to be disputed, shows that beyond question anyone outside of Germany producing or desiring to purchase nitrogenous fertilizers or similar compounds will have to deal with a single organization, essentially a branch of the German Government, which will have an absolute monopolistic control of all such products produced in Germany or whatever surplus there may be for export."

In this same connection I would like to read a statement made by Colonel Joyes.

MR. ANDERSON: Mr. Kresel, would you mind saying whether the report you have just read is an official report of the War Department or was it a statement submitted to a committee of Congress? I have not the report.

MR. KRESEL: I will read exactly what it says.

MR. ANDERSON: I have not the report before me and I want to know the exact status.

MR. KRESEL: The report is headed, "Statement of Col. J. W. Joyes, Ordnance Department, United States Army," signed "J. W. Joyes, Colonel, Ordnance Department, United States Army." Turning to page 92 of this booklet, in which the statement or report is contained, I read the following. This was a proceeding, your Honor, before the Committee on Military Affairs of the House of Representatives:

"MR. MCKENZIE: Now, is that all, gentlemen?"

Mr. McKenzie was one of the Congressmen.

"MR. ROBERTS: Mr. Chairman, we have a great deal of evidence to present here that we would like to present, and most of it is written."

And there (indicating) is Mr. Roberts sitting at the Government table.

"MR. MCKENZIE: You could put it right into the hearing.

"MR. ROBERTS: If you would allow us to take such parts from the Senate hearings as we presented to that committee, and send it here to this committee, we would do it that way, and we could end our hearing then.

"MR. MCKENZIE: We will be glad to give you that permission, Mr. Roberts. I have not had time to read the Senate hearings, but if you will include that in the House hearings I will get the benefit of it.

"MR. ROBERTS: I will do that."

Then "(Mr. Roberts submitted the following papers)," and what I have read, Colonel Joyes's statement or report, is one of those submitted.

MR. ANDERSON: If your Honor please, to the end that there may be no confusion in the record and that the position of the Government may be perfectly understood and taken as a precedent, I wish to make the formal motion to strike out the report or the statement to which reference has been made, on these grounds. The first I wish to state specifically, that while this particular publication is not covered by our stipulation, I am not objecting to proof of its authenticity; I waive that question, as it appears in a public document. But while an official report of Colonel Joyes, if submitted to the Secretary of War, would certainly under the rule under which we are proceeding in this case be admissible and probably be evidence in any case of the facts stated therein —as your Honor knows we have proceeded on that theory—a statement by Colonel Joyes to a committee in lieu of oral testimony, or oral testimony before a committee by an officer of the army or any

other subordinate officer of the Government, is not admissible in evidence.

Frankness compels me to say that I do not know that I have any objection beyond our general objections to Colonel Joyes's statement *per se*, but if we once start that, then we have the right also, on the same principle, to read in the testimony of witnesses or statements of witnesses not under oath made before the Committee, without calling those witnesses, which might lead to most far-reaching and prejudicial results.

Therefore, I feel constrained to make this motion to preserve the rights of the Government upon the grounds stated, and I think if Colonel Joyes's testimony is desired he should be called. I will add, however, that if this is all the information is going to be sought to be put in of this character, it might be that for convenience something could be agreed upon on that subject. I do not want to cause inconvenience or delay in the prosecution in the case; but I do feel it is my duty to make the formal motion to strike out, to preserve the rights of the Government in that regard, and to insist rather earnestly upon the principle upon which the motion is based.

Mr. Kresel: Just a few words, your Honor, as to the question of law raised. If your Honor is interested I have a memorandum here of authorities under which I have no doubt this is admissible. But I think that your Honor should know that the proceeding before this Committee of Congress to which the statement of Colonel Joyes was submitted was a proceeding upon the proposal to enact a law proposed by the War Department itself and that it was the Government, represented by the War Department, that offered to the Con-

gressional Committee this statement of Colonel Joyes.

And is it possible that the Government can now come into this Court and say "No, we do not stand by what Colonel Joyes said," or "We are not bound by it," if they presented it to Congress themselves? It seems to me that Colonel Anderson does not want to take that position.

MR. ANDERSON: If your Honor please, the Government of the United States is a rather large institution and how far outside the Courts the Government of the United States is bound by acts of its subordinate officers is a question which I think must turn upon the particular facts. I do very earnestly and very firmly take the position, with deference to the Court and to counsel, that statements before Congressional Committees by an officer of the Army, regardless of his rank, unless he occupies such a position that he does in fact speak for the Government in a matter of that kind, which might change his status, is not admissible here. Whether in that particular hearing the evidence was offered by a representative of the War Department or not, it is not evidence in a Court, and if the testimony is desired to be given in a Court the witness must be called and subjected to proper examination and cross-examination. To allow the reading of evidence of subordinate officers, or statements not under oath, given in informal proceedings before a Committee of Congress is probably the most informal proceeding in the world, and to read evidence given there, either for or against the Government, I will put it both ways, in a suit in which the Government was a party, affecting its property rights and those of the people of the United States, would be a most mischievous and dangerous principle.

MR. KRESEL: Your Honor, Colonel Anderson has not answered my question. He does not have to if he does not want to. I realize that. I am not now arguing a question of law. I intend to rely upon your Honor's rulings as to the admissibility of this as a question of law and in support of that, as I said, I have some authorities here. ing efficacy and value to the statement of Colonel But what I want to know is whether, aside from the question of law, the Government is now deny- Joyes which the Government itself submitted to a Committee of Congress. I think that is a very pertinent question; but Colonel Anderson does not have to answer it if he does not want to.

MR. ANDERSON: I will answer it, although I am not called upon to. My duties in this Court are fixed by the law. I have no discretion on the subject. If a thing is illegal, my duty is to object to it in this Court if I think it is illegal. How that statement was presented, who presented it to the Committee—it was a hearing before the Committee itself and not a proceeding of a judicial character —is a question that does not concern me in the slightest. If it were legal evidence, I would let it go in. Of course, I mean by that, I would raise no question. If it is illegal evidence, I know of no policy, no obligation, no right in this Court, except that which is fixed by the law.

MR. KRESEL: Does your Honor desire to make any ruling?

THE COURT: Was this report written?

MR. KRESEL: Yes.

THE COURT: Does the record show it was taken from the files of the War Department?

MR. KRESEL: It is headed "Statement of Colonel J. W. Joyes, Ordnance Department,

United States Army," and signed "J. W. Joyes, Colonel, Ordnance Department, U. S. Army."

THE COURT: Your stipulation merely covers authenticity, I take it?

MR. KRESEL: Yes, sir.

THE COURT: And does not cover relevancy.

MR. KRESEL: No, your Honor. It is expressly agreed that either side may object.

THE COURT: Will you give me the benefit of the authorities which you have there, Mr. Kresel.

MR. KRESEL: Yes, your Honor. This is a memorandum that we have written on the question of the admissibility of reports made by duly authorized agents of Executive Departments of the Government. A general statement of the law is contained in Wharton on Evidence, Section 638:

> "The official proclamations and other public documents issued by the Executive or Legislature are to be received as *prima facie* proof of the facts stated in them, when such facts are relevant, and of them when domestic judicial notice is taken."

That, your Honor will see, refers to official proclamations and public documents issued by the Executive or the Legislature.

THE COURT: This is a public document?

MR. KRESEL: This is a public document issued by the Legislature.

> "State papers, when published under the authorities of Congress, have a like effect. Thus, the diplomatic correspondence communicated by the President to Congress has been held in this sense evidence of the facts communicated. So the ordinances of foreign states promulgated by Congress are held proved by such promulgation.
>
> "The proclamation of a Governor of a State is *prima facie* evidence of the result of

the elections which it recites. The printed report of the State Comptroller to the Legislature"—see how far they have gone—"is *prima facie* evidence of the pertinent facts recited and so is the charter of a City as a general rule in respect of all domestic public conditions and acts. All statements as to the same, made or recited in any public Statute, or any documents sent by the Executive to the Legislature, or any Executive or Legislative documents authoritatively published will be judicially noticed, or if not, may be put in evidence if relevant."

May I read that last statement again, your Honor, because I think it sums up very well:

"As a general rule ..... all statements in any public statute or any documents sent by the Executive to the Legislature"—

this is a document sent by the Executive Department to the Legislature, because the War Department is only under the Executive; but even if it did not come in under that, it comes in under the following:

"Any document contained in Executive or Legislative documents authoritatively published"—and this is certainly a Legislative document authoritatively published—"will be judicially noticed, or, if not, may be put in evidence if relevant."

Wigmore has this to say (Section 1670):

"An inquisition or report, if made under due authority, stands upon no less favorable a footing than other official statements. As a statement made under official authority or duty, it is admissible under the general principle."

Now, is it contended that this statement made by this official Colonel Joyes was not made pursuant to duty?

Then I have several cases, your Honor; perhaps I might draw your Honor's attention to how far the cases have gone. For instance, in the case of Russell against the Brooklyn Daily Eagle in 168 Appellate Division, New York, it was charged that the defendant had published a libelous cartoon concerning the sale of a certain wheat preparation by the plaintiff. The defendant pleaded justification. To sustain its defense, the defendant offered in evidence a report of the United States Department of Agriculture. The Appellate Division held that these reports were admissible, and in discussing the question they say this:

> "Among the duties imposed and the powers conferred on the Department of Agriculture are the following: To acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture, in the most general and comprehensive sense of that word. To procure and preserve all information concerning agriculture which the commissioner of Agriculture can obtain by means of books and correspondence and by practical and scientific experiments, accurate records of which experiments shall be kept in his office; by the collection of statistics and by any other appropriate means within his power. The question is, are those records relevant evidence of the facts therein recorded upon the issue of justification."

Quoting the case of Evanston against Gunn in 99 U. S. 660, wherein the Court was considering the records of the Weather Bureau, the Court said:

> "They are, as we have seen, of a public character, kept for public purposes, and so immediately before the eyes of the community that inaccuracies, if they should exist, could hardly escape exposure. They come, there-

> fore, within the rule which admits in evidence official registers or records kept by persons in public office in which they are required, either by Statute or by the nature of their office, to write down particular transactions occurring in the course of their public duties or under their personal observation."

In Richards against Robin, in 178 Appellate Division, the State Superintendent of Banks brought an action to enforce a Statutory liability of stockholders of an insolvent bank. There, an inventory of assets and lists of the claims verified by the Superintendent of Banks were held to establish *prima facie* the insolvency of the bank. There was no statute there which made it a duty of the Superintendent of Banks to make any such inventory, but the Court said:

> "It is clear that the trial Court was right in holding that the inventory of assets and lists of claims were of the character of official public statements prepared and filed in fulfillment of a duty imposed by the law and open to the public."

Now, there was this officer of the War Department, who, according to the testimony, now went abroad as Chairman of a Committee to make an investigation for the Government. Congress had before it a proposed act dealing with the very subject. The Secretary of War personally appeared before this very committee and on this same day and testified upon the subject.

THE COURT: That is so shown by the official document.

MR. KRESEL: So shown by the record. The first witness was Secretary Baker, beginning at page 6 of this volume. The Government itself came in and presented these witnesses: Secretary

Baker, Mr. Roberts, Professor White who is sitting here, Colonel Joyes and Colonel Byrnes, I think, all bearing upon the proposed legislation. I might as well say to your Honor now what that proposed legislation was, because it has a bearing on the issue.

After the war, the Government had these two plants at Muscle Shoals, the cyanamid plant No. 2, and this plant No. 1; and the Government was confronted with the question as to what to do with them. The Government investigated and finally came to the conclusion that there was this solution to the problem and that was the solution that was proposed to Congress which was then investigated, namely:

That there should be organized under the laws of the United States a corporation; that the corporation was to be officered by officials of the War Department; that the corporation was to be free from taxation and was to take those two plants without paying a dollar for them; that twelve million dollars was to be appropriated for the purposes of the corporation so as to enable it to make the necessary changes in these two plants, so that they might try to operate them; and that the corporation was to sell this product to our farmers for fertilizer purposes.

The legislation did not pass, your Honor, because it was—well, I need not state the reasons. It did not pass. But it was a proposition put forth to Congress by the War Department and this statement that we are now offering was one of the documents presented to Congress upon which the Government asked Congress to act.

THE COURT: I will hear you, Colonel Anderson.

MR. ANDERSON: I have only a word to say, sir.

I recognize, of course, and have contended throughout this case and first presented the issue to your Honor, that the official reports of officers and departments of the Government of the United States, made in the discharge of their official duty, under authority of law, could be introduced as *prima facie* evidence of the facts stated therein. That I concede, of course. But I do not understand the rule to go to the extent that statements, even not under oath, made before a Congressional Committee in an investigation can be introduced without calling the witness for examination.

THE COURT: Do you differ in this, that this was an official report?

MR. ANDERSON: I do dispute that. The report does not show that. Here is what happened, if your Honor please, from the report. These officers of the Army were called up there, I presume, at the request of a Committee—it does not matter whom—to give statements in the usual manner. A number of them were there. The Committee's time apparently was greatly occupied and it was suggested that they could put their statements in writing. Or, they had already put them in writing, probably before the Senate Committee and it was suggested that those statements could be introduced in lieu of their testimony; and such statements were presented to the Committee in lieu of their oral statements before the Committee.

THE COURT: Then your thought is that this statement of Colonel Joyes was a written statement made by him to the Senate Committee.

MR. ANDERSON: To the House Committee. Some of them came out of the Senate records, and to save time, they were taken out of the Senate record and put into this record. Then this record was published like all hearings before committees,

by the public printer for the use of Congress. But that statement of Colonel Joyes occupies exactly the same legal position as an oral statement made by him before the Committee.

THE COURT: Do you differ from Colonel Anderson with respect to that, Mr. Kresel?

MR. KRESEL: In this respect only, your Honor, that the report or statement was not taken from the Senate report at all. It was a statement made directly to this Committee.

MR. ANDERSON: That may be true.

MR. KRESEL: And for the purposes of the Committee.

MR. ANDERSON: That may be true. Some of them were and some of them were not. I did not think that was material.

MR. KRESEL: In other words, your Honor, it was this way. Congress says to these officers of the War Department, "Go and prepare a statement and present it to us." Colonel Joyes did that and it is his statement I am now offering.

MR. ANDERSON: In lieu of an oral statement. The Committee said, "Let us have your facts or whatever you want to say to the Committee in writing instead of taking up the time of the Committee, twenty men, to hear your oral statement, because we are very busy."

THE COURT: Now then, I have it. I have been confused about it until this moment. We have the fact then that this statement is a representation of facts by the Executive Department of the Government or rather the Executive, possibly, of the Government, at the time this was made. The date I do not recall.

MR. KRESEL: April, 1920.

THE COURT: On a similar issue. It is that, is it not?

MR. ANDERSON: I have not so expressed it, if your Honor will permit me. Your Honor uses the expression of "the Government" in a very much broader sense than I do. I think when the Committee calls these individual gentlemen up there, there may be fifty men in the War Department who take views exactly opposite to those of Colonel Joyes. It was his individual statement. The Government of the United States, I take it, can only speak through certain recognized channels. The Committee can call anybody. It can call me or anybody else up there and ask, as they have done with Colonel Joyes in this case, what I think. I may give an opinion on what I am advised is a question of policy. But it is in no sense the Government speaking. It is their inquiry into the minds of persons who they think are informed as to certain facts. They may be correct or not.

Suppose some one were to go before a Committee, for instance, and state as a fact some scandalous matter about some high officer of the Government. Such things have happened. Surely, that would not be received, simply because he went there before a Committee, as even *prima facie* evidence of that fact.

THE COURT: In what capacity was Mr. Roberts acting at that time?

MR. ANDERSON: Mr. Roberts was at that time, I think, acting——

MR. ROBERTS: At that particular hearing?

THE COURT: I did not want to go into external evidence. I only wanted to know what the record showed.

MR. ANDERSON: I do not know.

THE COURT: I have no objection to your shortening that information.

MR. KRESEL: He was Assistant Nitrogen Administrator of the War Department.

MR. ROBERTS: May I correct that?

MR. KRESEL: Is there any disagreement about that? Because I do not want to make a statement that is not a fact.

May I direct your Honor's attention to the fact that Secretary Baker at this very hearing, when asked a question, says: "I can not say that any effort was made. Mr. Roberts knows more about that than I do." He brought Mr. Roberts there as his representative.

MR. ANDERSON: He was a Special Assistant to Secretary Baker, so he tells me, or the Secretary at that time, advising on these nitrogen matters.

THE COURT: And he presented these statements?

MR. ANDERSON: And at the suggestion of the Chairman of the Committee he presented these statements in writing. I did not wish to argue the question, your Honor, but I felt compelled to raise the question.

THE COURT: It is perfectly proper to raise the question.

MR. ANDERSON: And of course, I make a motion to strike out, and reserve the point for your Honor's consideration.

THE COURT: That represents the attitude of the War Department and constitutes representations made by the War Department and whether or not the doctrine of estoppel would in any sense apply, it seems to me that it is evidence that is not without relevancy.

MR. KRESEL: I did not mean to interrupt your Honor, but I was looking for something and I was glad I was able to locate it in this mass of stuff. I had in mind that Secretary Baker himself re-

ferred to these experts for the Committee to rely on them, and I find it on Page 26 of this book: "Secretary Baker: If the Committee desires to hear the experts, they are here and will take up the matter with you."

THE COURT: Admitted.

MR. ANDERSON: I note an exception.

THE COURT: The usual morning recess.

(Thereupon a short recess was taken by direction of the Court).

MR. KRESEL: Now, your Honor, this statement of Colonel Joyes, as I stated to your Honor, was submitted at the hearing of April 19, 1920, before the House Committee on Military affairs.

I now want to read a statement made by Colonel Joyes before the Senate Committee on the very next day, namely, April 20, 1920, upon the same legislation.

THE COURT: And produced under like circumstances?

MR. KRESEL: Let me state to your Honor exactly. The report shows as follows: I do not know, gentlemen, whether you have a copy of this.

MR. GALLOWAY: Yes, we have it. What page is it?

MR. KRESEL: Page 325: Committee on Agriculture and Forestry, April 20, 1920.

"The committee met at 10:30 o'clock A. M., Senator Asle J. Gronna presiding.

"Present: Senators Gronna (chairman), Smith of South Carolina, Randell and Kendrick.

"Present also: Hon. Newton D. Baker, Secretary of War.

"THE CHAIRMAN: The committee will come to order, and we will take up for consideration Senate Bill 3390, a bill providing for

the production of atmospheric nitrogen. Col. Burns, whom do you wish to have heard first?"

Of course, there is no dispute but that Colonel Burns was a Colonel of the War Department?

MR. ANDERSON: I shall assume so; Colonel of the Army of the United States.

MR. KRESEL: Of the Army, yes. Now, Colonel Burns makes this statement:

> "COL. BURNS: Mr. Chairman, one of the points raised by Mr. Washburn, and practically the chief point, was the negotiations that took place between the American Cyanamid Co., and the Ordnance Department; and if I have the correct impression, it was his statement that his first offer to the War Department was on a basis of practically no profit to the American Cyanamid Co., and that throughout his war work it was not his desire to make any unreasonable profit. Now, in order that you may get a proper picture of those negotiations, Col. Joyes is going to make a statement, as he was at all times intimately connected with the negotiations that took place.
>
> "THE CHAIRMAN: You want Col. Joyes to be heard first then, Col. Burns?
>
> "COL. BURNS: Yes, sir.
>
> "THE CHAIRMAN: Very well."

THE COURT: The Secretary of War being present?

MR. KRESEL: The Secretary of War being present. In other words, it is quite apparent, your Honor, that Colonel Burns was in charge of this legislation for the War Department.

THE COURT: I will assume that like objections are made to this as were made to the preceding

question, and the same ruling, and same exception.

MR. KRESEL: I read from page 323 the following statement of Col. Joyes.

THE COURT: This is in a public document, as I understand it.

MR. KRESEL: This is in a public document entitled, "Production of Atmospheric Nitrogen—Hearing before the Committee on Agriculture and Forestry, United States Senate—Sixty-Sixth Congress, Second Session, on S. 3390," and I might as well here read the title of the bill:

> "A Bill to provide further for the national defense; to establish a self-sustaining Federal agency for the manufacture, production, and development of the products of atmospheric nitrogen for military, experimental, and other purposes; to provide research laboratories and experimental plants for the development of fixed-nitrogen production; and for other purposes."
>
> "Printed for the use of the Committee on Agriculture and Forestry. Washington Government Printing Office, 1920."

I read from page 328 the following statement, made by Colonel Joyes:

> "With that preamble as to early history, we may jump, I think, right up to the time when the United States came into the war. The national defense act had been passed the year before—merely eight months before—and several committees had been appointed by the President and the Secretary of War to advise as to how to act in that particular matter of the provision of fixed-nitrogen for war needs, and the first committee had made a recommendation which looked rather to the ultimate future. It provided that we should improve the river at Muscle Shoals and get

the power work started, which would take, they figured, something like four years, I think. It also contemplated an arrangement that concerns be invited to bid upon the power and come down there to use it for fixation purposes. That was the recommendation of the committee; there were other things, but essentially that was it.

"Just about the time that the committee reported, in January, 1917, some information came out about the progress that had been made in the new synthetic ammonia process of the General Chemical Company. That was working in the laboratory of the General Chemical Co., on a scale which was very small. It was an improvised apparatus for experimental work only, and yet it was larger than the glass and rubber apparatus that the chemist generally makes his preliminary experiments with. But that apparatus had been tried by the General Chemical Co., sufficiently to justify them in drawing plans and placing orders for apparatus for buildings for a plant in the neighborhood of New York, to cost somewhere in the neighborhood of $1,000,000.

"Certain people represented to the Chief of Ordnance and to the Secretary of War that this process looked so promising that we had better go into it or at least we had better have it thoroughly considered. So a new committee was named, taking a great proportion of the old committee and adding more of it to reconsider that.

"They thought that process was worth developing, and they recommended that it be developed, and that was finally approved in July, 1917, about four or five months after the United States entered the war.

"It was recognized that that was no step of any consequence in the production of what we needed for the war, but it was a step which might lead to very large progress in the production for the needs of the war and it was

considered by these gentlemen who formed that committee as being well worthy of trial. At the same time, whatever progress it did make would be highly desirable; and it was a step toward an achievement corresponding to what the Germans had made in the celebrated Haber process, of which we knew very little. The Haber process was kept distinctly secret and its patents were very strong, very broad, but they pretty effectually avoided such particularization as would enable anybody to make use of them."

MR. ANDERSON: One moment, sir.

MR. KRESEL: I have not finished reading, Colonel Anderson.

MR. ANDERSON: I want to note an objection to that specific statement. If the witness were in court he would not be permitted to testify in that language; and therefore, to read it as *prima facie* evidence of his opinion of these patents, without his having the patents before him or any opportunity at all to test his knowledge, is of course admitting under formal statement evidence which could not be adduced in court in that form.

MR. KRESEL: May I finish reading one more paragraph, and then if your Honor desires to hear anything further about it, I shall be glad to state my views.

THE COURT: I shall not ask you to do anything further. It seems to me that this is in a little different position from what you suggest, Colonel Anderson,—I may be wrong—for it seems to me that this is a representation made by an Executive Department, to wit, the War Department, with respect to these patents, and consequently is indicative or expressive of the position heretofore taken by the Government of the United States, or

the Executive Department thereof, with respect to these patents. I think that is slightly different.

MR. KRESEL: May I state further, your Honor, that Col. Joyes is still with the Army, subject to the orders of the Executive and War Departments, is available to the Government if they desire to get his testimony, stationed at Governor's Island, New York, at this very minute. I have one more paragraph to read, and then perhaps, Colonel Anderson, you may want to state your objection to the whole thing.

MR. ANDERSON: I merely interrupted for the purpose of directing attention to that particular thing.

MR. KRESEL: Yes; you have done that.

> "At that stage of the matter the Ordnance Department set up the Nitrate Division, putting me in charge of it, to carry out that program of developing that process and at the same time giving us permission to inquire into a number of other processes so that we might have our eyes open to anything that was developing and be ready to take advantage of anything."

MR ANDERSON: Are you through now?

MR. KRESEL: Yes.

MR. ANDERSON: I want to get, if your Honor would permit me to do so, a little more clearly the ruling of the Court, because I do not want to make objections against the ruling, it once being made. The last ruling that the statement by Col. Joyes was a representation by the Executive Department which estopped the Government or might operate to estop it——

THE COURT: I have refrained from saying that it is an estoppel. I have not undertaken to define just the legal principle upon which it operates.

The memorandum of Mr. Kresel stated three grounds. Under the first one Mr. Kresel said it is not; and it seemed to me that possibly it would come in on either of the other two.

MR. KRESEL: Certainly under the third, your Honor.

THE COURT: But it seemed to me that possibly the intermediate one was slightly stronger. However, I think it is not without evidential value; so without going over what we did before——

MR. ANDERSON: I just want to get the point clear.

THE COURT: I realize the difficulties and complexities of estoppel with respect to the Government of the United States.

Q. 158. Dr. Parsons, on last Saturday in giving us the sources of nitrogen you mentioned the coke ovens and the Chile nitrates; you will recall?

A. Yes.

Q. 159. Did you during the year 1919 and prior thereto and since, keep yourself informed of the selling price of ammonia in the United States market?

A. Yes.

Q. 160. What was the average price at which ammonia was sold in the American market, say, in the Spring of 1919, and say for a year prior thereto and for a year following that?

A. Approximately ten cents a pound for the NH-3.

Q. 161. What is NH-3?

A. Ammonia contained in the aqua which is usually sold.

Q. 162. At page 4 of your report to the War Department I read this statement. I wonder, Doctor, if you could locate it for me (handing paper to witness). I am looking for the statement that you made with reference to the cost of coke oven production of ammonia. Will you please see if you can locate that?

A. (Witness looks through paper.)

Mr. Kresel: While Dr. Parsons is trying to find that, I read from page 130 of Defendant's Exhibit 140, the following statement, beginning at the bottom of page 129:

"It will be seen from the above estimates that the cost per pound of ammonia"—Before I read that I desire to direct the Court's attention to a table at page 128 of this report, Defendant's Exhibit 140, which is a statement headed "Summarized costs per ton of ammonia," by the General Chemical Company's process used in Nitrate Plant No. 1.

The result arrived at by this official report is this—that the cost per pound if water gas hydrogen is used is 11.1 cents, while if electrolytic hydrogen is used it is 10.7 cents per pound. Please, your Honor, bear that in mind in connection with Colonel Joyes's figures, which were between 16½ and 12.9 cents per pound by the German Haber patent or process.

I also direct your Honor's attention to page 95 of this official report, Defendant's Exhibit 140, from which it is made to appear that the cost of ammonia per pound produced by the cyanamide process was 10.6 cents per pound. That appears at page 95 of this book. I read from page 129, beginning at the bottom of the page, as follows. (Reads from exhibit.)

Mr. Anderson: May it please the court, I notice that these extracts being read are being taken down in the record. For several weeks we were engaged in reading a number of extracts which were not taken down in the record. If all of these extracts from reports which are in evidence are reproduced on the record, this record, which has already grown out of all reasonable proportions,

will reach a stage which will practically defeat the aims of a trial. All this is in evidence and of course can be used in argument.

Therefore, while I have no objections to a brief statement being read to keep the connection, to summarize and bring it together in argument form, to put these long extracts from these various reports upon the transcript of the record, which reports are in evidence, is entirely varying the practice which was established earlier in the case and will lead to a most enormous expansion of this record, and I would have to submit to the Court whether that can be done. It is in evidence already, and certainly duplication of the evidence is not in accordance with the rule.

Mr. Kresel: I have no choice in the matter, your Honor. I did not know whether they were taken down or not. However, from this point on we will understand they will not be incorporated.

Mr. Anderson: The stenographers have been taking them this morning. I was informed it was done at your request. I did not want to object to a few of them, but the entire record this morning is practically taken up with these extracts.

The Court: I did not know anything about that and did not know they were being taken. I thought we indicated earlier in the trial that it was useless to duplicate the reading, and if you had spread upon the minutes what Mr. Galloway read in the trial it would be much longer than it is.

Mr. Anderson: Of course.

The Court: That is unnecessary and I think should not be done; because you can print in your brief such matters or such portions of these exhibits as you desire, and then that is at your own

expense and not increasing the cost on the losing party, whoever that may eventually be.

MR. KRESEL: Any direction your Honor desires to make will stand.

THE COURT: Sufficient reference may be made by the stenographer as will identify the portion that is read.

MR. ANDERSON: Certainly, sir; and where there is just a little extract from a paper to connect the argument I have no objection to having it in.

THE COURT: Let the stenographers use their own discretion on that. I cannot supervise it.

MR. KRESEL: With respect to the second statement of Colonel Joyes, which I read from the Senate report, that was not offered in evidence. If the stenographer is not to put it in as I read it, I desire to put it in evidence.

THE COURT: No, I am not going back over the record.

MR. KRESEL: I see. It is only as to the future.

THE COURT: The record is being made up as fast as the trial proceeds and we cannot have the record rewritten for that purpose.

Q. 163. The part of your report that I was looking for, Dr. Parsons, is at page 16 of this defendant's Exhibit No. 177. You say there:

> "The cost of ammonia has at the present time no relation to its selling price. The actual cost of collecting, absorbing, and purifying ammonia from the gases developed by the destructive distillation of bituminous coal—in other words, the cost of ammonia considered as a by-product is less than by any other process."

Is that the fact?

A. Correct.

Q. 164. Was that true in 1919?

A. Yes.

Q. 165. "The selling price of by-product ammonia is entirely a question of competition with other nitrogenous products and has been fixed in the past almost wholly by the market price of sodium nitrate with which it enters into competition." Now, is sodium nitrate what we laymen understand as Chili nitrate?

A. Correct.

Q. 166. And by-product ammonia, is that what you were describing as the ammonia derived from coking of coal?

A. Yes.

Q. 166-a. I continue reading from the report:

"Even should ammonia be placed on the market by the Haber process, at a price as low as four cents per pound"—what Haber process were you talking of there?

MR. ANDERSON: I object, if your Honor please. He is reading from a report. The report speaks for itself.

MR. KRESEL: Has not this witness the right to say what he was talking about in view of the fact that he has already said that Haber was a generic term which was used with three different kinds of modifications?

THE COURT: Do you press your objection, Colonel Anderson?

MR. ANDERSON: Yes, sir.

THE COURT: Finish reading, and then you can go back to that question.

Q. 167. I will re-read the sentence: "Even should ammonia be placed on the market by the Haber process at a price as low as four cents per pound, by-product ammonia will still be sold in competition therewith at a profit to the producer." Now, first I ask you,

Doctor, which Haber process you were talking about there, as producing as low as four cents per pound?

THE COURT: I think the objection to that question is well taken. It seems to me that it might be open to a construction that all Haber processes were open, and I want to see whether there is any ambiguity.

Q. 168. I will read it again, your Honor:

"Even should ammonia be placed on the market by the Haber process, at a price as low as four cents per pound, by-product ammonia will still be sold in competition therewith at a profit to the producer."

I will pass that, your Honor.

THE COURT: I will be prepared to rule on it in just a moment. You can pass it if you will. Is it your desire to pass it or press it?

MR. KRESEL: No, your Honor. I rather understood that your Honor felt the objection was well taken.

THE COURT: I was re-considering it, and I am not just sure whether it is or not. I was thinking of the witness's testimony, if I may think aloud just for a moment. I was thinking of the witness's testimony this morning that there were four of those processes, as I recall them.

MR. KRESEL: It was on Saturday he described them all and said the Haber was a generic term for all of them, and then this morning he segregated the patents, that is the patents applying to the German Haber process.

THE COURT: As to whether the method sought to be used by you in your question is the proper method for removing ambiguities when the witness is on the stand, or whether the question should be

an independent question rather than one directed to his report——

Mr. Kresel: May I withdraw the question, your Honor, and I will see if I can get it in a way that is not objectionable.

Q. 169. I direct your attention to page 11 of your report, the second paragraph of that page, you say there—"Trustworthy information regarding the cost of production of ammonia by the Haber process indicates that pure anhydrous ammonia can be produced in liquid condition for a cost slightly less than four cents per pound." Now, where—you did not say here in this paragraph as to where it could be produced at four cents per pound; and I am asking you now to state in connection with that statement.

Mr. Anderson: I ask to read the entire paragraph if your Honor please. I object to the question.

"The Haber process is not at present in use outside of Germany on account of the lack of detailed information regarding plant construction and operation and also owing to the very large royalty demanded by the Badishe Co. for its use by other concerns. It is, however, more than probable that the Badische Co. will itself install and develop the process outside of Germany when the war is ended."

Then comes the sentence referred to:

"Trustworthy information regarding the costs of production of ammonia by the Haber process indicates that pure anhydrous ammonia can be produced in liquid condition for a cost slightly less than four cents per pound. It is improbable that any arrangement could be made for the United States Government to use the Haber process pending the conclusion of the European war. It is probable that when the war is ended the

Haber process will be installed or will be available for installation in the United States. It is the cheapest process for the production of synthetic ammonia. It is independent of cheap power—the power being a small fraction of its cost. If desirable, it could be readily installed in moderate sized units in connection with ammonia oxidizing plants at any munitious plant."

There can be no question of ambiguity, as to what can be meant by that sentence taken as a whole.

MR. KRESEL: Now, I say this with regard to ambiguity: if Colonel Anderson thinks it is not ambiguous, if he will say the passage means that the four cents produced ammonia in Germany under the German Haber process, I am perfectly willing to stand on that, but I won't leave Colonel Anderson a chance of saying hereafter that this witness's report was that in the United States, under any process, call it Haber or anything you want, you can produce ammonia at four cents a pound. Now, I am entitled to have the record show exactly what is meant thereby.

THE COURT: Is there a difference between you, Colonel Anderson?

MR. ANDERSON: Yes, sir. I stand on the language of that paragraph.

MR. KRESEL: You do?

MR. ANDERSON: And I am going to stand on it in argument, and if an effort is made to have it enlarged or explained, I shall respectfully object to such a question and let the record stand as it is.

THE COURT: Suppose we have that answer then, and determine that afterwards.

MR. KRESEL: Yes, sir.

THE COURT: I am trying to keep clear two

things, as to whether this is independent testimony you are asking him or whether it is the interpretation of the document. As I understand the question that has been independent testimony which could be used possibly in connection with that, but you are asking him a question independently of this document which had been introduced in evidence.

MR. KRESEL: Independent of this. I was only directing his attention to what was contained in the report; and your Honor will recall, if you will pardon me, that this report was rendered early in 1917, the witness having made the trip abroad in 1916.

THE COURT: I was under the impression it was independent testimony. All right. You may answer.

MR. KRESEL: Will you answer?

A. That was information given me by the Norwegian engineers, which was the best I could get as to the price of production of ammonia in Germany by the Haber process at that time.

MR. ANDERSON: I object on the further ground that it is purely hearsay.

THE COURT: I think the answer is not responsive to the question and I am going to ask that it be stricken out and the question repeated, because I think the witness did not understand it any more than I did when I mentioned it.

MR. KRESEL: Will you repeat the question?

(Q. 169. Repeated as recorded.)

THE WITNESS: In Germany.

MR. KRESEL: That is the answer.

MR. ANDERSON: Now, the answer of the witness preceding, says that he never has been in Germany during the war, and had not down to that

time, and he derived his information from hearsay. Therefore I move to strike it out as obvious hearsay.

THE COURT: Colonel Anderson, I think either you misunderstand the situation, or I do, let us see which it is. He says in his report that it was four cents a pound.

MR. ANDERSON: Yes, sir, but he tries to explain his report by saying why he was told that—I beg your pardon, your Honor. I did not intend to interrupt you.

THE COURT: I know you did not, but I do not understand it as hearsay, if you are going to stand on his report. I do not see how his last answer is objectionable as hearsay, do you?

MR. ANDERSON: I am speaking of a written document, as *prima facie* evidence of facts, submitted to the War Department. Now this gentleman is trying, as I understand it, to entirely vary the natural meaning of that document by undertaking to introduce some information that he got from Norwegian engineers as to value in Germany.

THE COURT: That was struck out.

MR. ANDERSON: I know, but he stated the source of his information.

THE COURT: Do you want to restore it? I thought I was ruling in your favor.

MR. ANDERSON: The record I suppose will show he made that answer. I moved to strike it out, and your Honor called for it to be stricken out, that is the way the record is made up in these other cases. Therefore I say that the record now shows his statement in open Court, and shows that his sources were hearsay, and his answer can not stand.

THE COURT: In this instance I think I am right.

MR. ANDERSON: I will assume that your Honor is always right for the purpose of this Court room. I am reserving merely the rights upon the record.

THE COURT: You were inquiring as to who was right in this particular instance. You may proceed, Mr. Kresel.

Q. 170. Now, I read one more sentence from page 16 of your report, where you speak of the cost of ammonia. Speaking of the by-product ammonia you say:

"Its cost price is largely a matter of bookkeeping. Its selling price will in the future as in the past depend upon the competition of other sources of combined nitrogen. The Haber process can produce and is producing ammonia synthetically cheaper than any other synthetic process now industrially applied."

I ask you now where, at the time you made this report, the Haber process was producing ammonia synthetically cheaper than any other synthetic process?

MR. ANDERSON: The same objection.

THE COURT: Same ruling, same exception.

A. In Germany.

Q. 171. Now, Dr. Parsons, based upon your experience and your knowledge of the development of the art of fixing nitrogen, your knowledge of the U. S. Haber patents, which you described this morning, and which are now in evidence, the fact that the General Chemical Company had developed in the United States a new direct synthetic ammonia process under United States Letters Patent, the fact that the Claude direct synthetic ammonia process had been developed in France, the lack of information as to how the processes

covered by the U. S. Haber patents could be carried out in the United States, the fact that there were other methods of fixing nitrogen, such as the arc, the cyanamid and the cyanide processes, the fact that the cost of producing ammonia by the German Haber process in the United States would have been higher than the cost of production by the cyanamid process, the fact that the cyanamid was well known and had for a number of years been commercially successful, the fact that the production by the direct synthetic ammonia process would necessarily come into competition in the United States with the production of the cyanamid process and the production from by-product coke ovens and with Chilean nitrates, taking into consideration the lack of skilled personnel to operate under the Haber patents in the United States, even if the information as to how the processes described therein could be successfully carried out, were available, the fact that outside of Germany there was no plant anywhere in the world producing ammonia by the direct synthetic ammonia process, and that the only plant that had been built in the United States, to wit, plant No. 1 at Sheffield, Alabama, and the synthetic ammonia process developed by the General Chemical Company was not a success; what in your opinion was the value of the Haber patents in the United States in the months of February, March and April, 1919?

Mr. Anderson: I note an objection to the question, because it does not correctly state, or fully state the evidence, and further it does not appear that this gentleman has had an experience which enables him to give a commercial value to patents.

The Court: I think the second objection is not well taken. The second ground of your objection is not well-founded, but if you care to point out the specific differences in your opinion——

MR. ANDERSON: If your Honor please, that would be a rather difficult thing for me to do. I would have to study the hypothetical question, I can not carry it in my mind, but a number of things occurred to me as being incomplete, and it is impossible to accurately carry that question in my mind and undertake to point out the difference in the evidence.

THE COURT: Then we will take the answer to the question, and if during the recess you care to consider it and tell us after the noon recess, the specific differences, there will be an opportunity to correct it. Meanwhile, you may answer.

A. No value whatever for manufacturing purposes.

MR. KRESEL: You can cross-examine.

MR. ANDERSON: Does your Honor wish me to proceed with the cross-examination at this time? I think once it is started, it is easier to keep at it than after a break of say ten minutes.

THE COURT: Suit your own convenience.

MR. ANDERSON: I prefer to start after the recess.

MR. KRESEL: Before your Honor takes a recess, there was one patent in this list of Haber patents that was not available this morning, your Honor will recall. I now desire to offer it. That is to go in Group——

THE CLERK: Defendant's Exhibit No. 237.

MR. KRESEL: Yes. You accepted the exhibit at the time.

THE CLERK: That is the one that was given a number.

THE COURT: We will take a recess.

MR. ANDERSON: If it is just the same would you

mind taking an hour and a half and if necessary sit a quarter of an hour later.

THE COURT: We will recess till 1 o'clock.

AFTER RECESS.

MR. ANDERSON: May it please the Court, I have just received since I came into the court-room, from the stenographer, the copy of the hypothetical question and answer. I have not been able to read it, so I will have to defer it a little longer.

THE COURT: Take it up in the morning, then.

MR. ANDERSON: I wish to say, further, to your Honor upon consideration of your Honor's very courteous statement of this morning, we have reached the conclusion that we should like to have the witness Doctor Volwiler recalled, and with the right of cross-examination under the conditions which your Honor has suggested.

THE COURT: I would like to speak with counsel. (Discussion of Court and counsel.)

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 172. Dr. Parsons, when did you first become connected with the Government of the United States, and in what capacity?

A. It was, if I remember correctly, in August of 1911, as Chief Mineral Chemist of the Bureau of Mines.

XQ. 173. That is, connected with the Interior Department, was it not?

A. The Interior Department.

XQ. 174. Prior to that time what had been your business? Possibly I may duplicate some questions,

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because I have not been able to read your testimony of Saturday.

A. I have been Professor of Chemistry and Head of the Chemical Department in the Durham College, at Durham, New Hampshire.

XQ. 175. How long had you been at the Durham, New Hampshire, College?

A. After graduating at Cornell in 1888 I went almost immediately as assistant chemist of the Agricultural Experiment Station which was at that time located at Hanover, New Hampshire. The college at that time was connected with Dartmouth. In 1893, I think it was, it was removed to Durham, and we built our own chemical department and chemical laboratories, and I had charge of them, was put in charge of the department, and remained in charge of the department, which grew quite rapidly until 1911. The New Hampshire College is now the University of New Hampshire. I left there to go with the Bureau of Mines in the summer of 1911; I think it was August and it may have been late July.

XQ. 176. Up to the time you went with the Bureau of Mines you had no industrial or manufacturing experience at all?

A. I had been consulted more or less with reference to industrial processes and have been on certain court cases.

XQ. 177. Will you be a little more specific; by whom were you consulted and when?

A. You are going so far back, Colonel, that I am afraid it would be difficult for me to give you anything accurate about that at the present time without looking it up. I was on numerous cases; those I remember chiefly were for the solicitor at Manchester. In those days they were having a great many cases as to whether lager beer was an intoxicating liquor or not,

and I came in on quite a number of those, I remember, during one summer. I acted also in some of the Maine ports on similar matters

XQ. 178. In other words, you testified as an expert as to whether beer was an intoxicating liquor or not, is that the idea?

A. Yes.

XQ. 179. Can you give me any other industrial experience that you had?

A. Before I went to the Bureau of Mines?

XQ. 180. Yes, before you went to the Bureau of Mines.

A. I consulted for a manufacturer of leather.

XQ. 181. About what year was that?

A. Anywhere from 1905 to 1910. I was at different times, as is usually the case with professors that are head of departments, asked to undertake certain small propositions. I built no plants until after I was with the Bureau of Mines.

XQ. 182. Your experience up to the time you were with the Bureau of Mines then was as a witness in chemistry in these cases which you speak of in Court?

A. No extensive industrial experience.

XQ. 183. Well, doctor, I would like you to be a little more specific. Extensive industrial experience means nothing to me. I want to know just what you did.

A. This firm in Dover, for example, had some proposition with reference to the cement that it had to have in connection with its leather belting. I remember I worked for two or three months for them to solve that proposition and did solve it and made the necessary——

XQ. 184 (interposing). Let us see exactly what you did. You say you worked two or three months. What did you do in that work?

A. I developed a cement for them which answered their purpose, waterproof cement for leather belting.

XQ. 185. That was a chemical process?

A. Chemical process.

XQ. 186. Can you name any other industrial experience and state exactly what you did, if you please?

A. I worked for a firm in Boston.

XQ. 187. About what time?

A. Well, as I have it in mind, it was somewhere in 1909 and 1910, on the question of mining and production of Fuller's earth, used in cotton seed oil refining and petroleum refining mainly with an idea of developing certain deposits in the South, and I developed a patent at that time for treating Fuller's earth which was not issued until some years later, I do not remember just when, for treating Fuller's earth so that it could be recovered and used over again.

XQ. 188. That was a purely chemical service, was it, the working out of the chemical process of the use of Fuller's earth?

A. Yes.

XQ. 189. Purely that. During all the time of which you speak, you were acting as professor and instructor at New Hampshire College?

A. Acting as what?

XQ. 190. Instructor or professor, I do not know which?

A. From 1893 on I was professor of chemistry, and from about 1894 I was in full charge of the Chemical Department until the time I left, with several people under me.

XQ. 191. State any other industrial experience that you had, stating about the time, just what you did, and for whom?

A. I developed or worked out a method—I am not quite sure that you would call this exactly industrial—for the analysis of milk so that farmers—that is when

I was at the experiment station—could at home determine the composition of milk which went to the creameries, and installed that in a number of New Hampshire creameries.

XQ. 192. You worked that out in the laboratories, did you not?

A. I worked that out in the laboratory.

XQ. 193. Did you work out the other process in connection with the cement in your laboratory?

A. Yes. I also was at other works to a certain extent, but it was chiefly a laboratory proposition.

XQ. 194. In the matter of the Fuller's earth, you worked at that in your laboratory, did you not?

A. Yes, with plant observation.

XQ. 195. Where was the plant?

A. Well, I went through these Fuller's earth plants at Allentown, Florida; Atapolgus, Georgia; at Dry Branch near Macon, Georgia; and some of the processes which I have developed have been installed in the plant since.

XQ. 196. You went through them before or after you worked out the process?

A. Why, in connection with it. I cannot say whether it was before or after.

XQ. 197. Can you think of any other industrial experience that you had prior to 1911 than that you have named, stating just about what you did, and where, and when, and for whom.

A. That is all I can recall at the moment.

XQ. 198. Then you went with the Bureau of Mines of the United States. Can you state briefly what was the character of your duties at the Bureau of Mines? First, what was your position officially, and what was the character of your duties?

A. I was chief mineral chemist and I was chief of the Division of Mineral Technology from the early days through. Just when my commission as chief of

the Division of Technology came, I would have to refer to the records; but it was early while I was in the Bureau of Mines.

XQ. 199. What were your official duties in that position?

A. To handle anything that the Bureau of Mines had to do with the technology and development of processes having to do with the non-metallic minerals, eliminating iron and steel, gold and the precious metals. I think all of the others came under my direction.

XQ. 200. Was your work performed in the laboratory or office in Washington? Did you go out in the field? Or what was it?

A. It was in the laboratory; it was in the works; it was in the field; all three. I had many people under me.

XQ. 201. You left the Bureau of Mines when, Doctor?

A. I resigned—I left on the 1st of April, 1920-1919.

XQ. 202. 1919. Then where did you go?

A. What did I say—1st of April?

XQ. 203. First of April, 1919.

A. That is incorrect. It was on the first of November, 1919.

XQ. 204. You left the Bureau of Mines on the 1st of November, 1919?

A. The 1st of November, 1919.

XQ. 205. Then you were still employed by the Government in the Bureau of Mines when you went to Europe in 1916?

A. I was, certainly, yes, except I was transferred to the War Department, as stated, for that purpose.

XQ. 206. Were you formally transferred or were you merely ordered by the Secretary of the Interior to discharge this service for the War Department?

A. I was formally transferred.

XQ. 207. And you went over to Europe for the specific purpose of investigating the question of the fixation of nitrogen, using that expression in the way it has been used here?

A. I did.

XQ. 208. Were you accompanied by anyone else?

A. I was not accompanied by anyone; but I met Mr. Eiston Berg in France, and he went through France and Italy with me.

XQ. 209. Was he retained by the Government of the United States to assist you?

A. He was.

XQ. 210. I understood you to say that you were given very free access to the information and plants of the governments and others in England, France, Italy, and Norway; am I right about that?

A. Sweden.

XQ. 211. And Sweden. Is that correct?

A. Correct.

XQ. 212. Was that access and information made available to you through the action of our Embassies, or how?

A. Why, part of it was, and most of it I simply got by personal contact and request myself. In a few instances, especially with reference to the Italian plant, the Embassy made the request for me.

XQ. 213. You were travelling as the head of the Chemical Department of the Bureau of Mines, or as the representative of the War Department—which?

A. The representative of the War Department.

XQ. 214. And you represented yourself to these gentlemen to be the official representative of the War Department; is that true?

A. And of the Interior Department.

XQ. 215. And of the Interior Department, too?

A. I had letters from Secretary Lane also recommending me to them. Both of them were used.

XQ. 216. How long were you in Europe, Doctor?

A. From approximately the 1st of October, when I landed—I can not give you the exact date. I returned and was in New York Harbor the day before Christmas, 1916.

XQ. 217. And then you prepared and submitted the two reports which have been introduced in evidence here by the defendant, is that right?

A. Yes.

XQ. 218. What duties did you then take up in connection with the Government? My understanding is, of course, that you continued your official connection with the Bureau of Mines?

A. Yes.

XQ. 218 (continued). But I mean, did you continue to work with the War Department or with the Bureau of Mines?

A. I was officially, shortly after my return, again transferred to the Interior Department.

XQ. 219. And did you then have anything more to do with this question of nitrogen fixation which we have had under consideration?

A. I had a great deal to do with it. I was in close touch with it, receiving practically all the reports on my desk that the Government received, until I left the department.

XQ. 220. In 1919?

A. In 1919.

XQ. 221. When you speak of receiving all the reports which the Government received, do you mean the reports from the Government officers, or do you mean reports from foreign governments, or from whom?

A. Why, I mean most of these people who went abroad to investigate the subject and most of the reports that came from abroad with reference to this

question were given to me in a consulting way by General Crozier, General Wheeler, and with Colonel Joyes and others who had touch with the situation. I was a member of the Nitrate Commission of the War Department.

XQ. 222. You continued that official connection with the War Department?

A. Oh, I had official connection with the War Department.

XQ. 223. Throughout that period?

A. I had full charge and built the plant at Saltville.

XQ. 224. Did you have anything to do with the building of Plant No. 1 at Sheffield?

A. In a way, yes; but not so closely as I did with reference to the other plant.

XQ. 225. Would you mind explaining a little more what you mean by "in a way;" just what you did?

A. Yes, during the early days when the engineering was started by Division T, and when Col. Joyes was in charge——

XQ. 226. One minute, Doctor. I do not want to interrupt you; but if you will observe my question, I asked you to state what you did. I know it is very difficult sometimes; but it will save me the trouble of moving to strike out answers, if you will try to confine them as narrowly as you can to my questions.

MR. KRESEL: He has answered it. Just read the question.

MR. ANDERSON: He was going into a statement of what Colonel Joyes was doing.

MR. KRESEL: No, indeed; he was only fixing the time. Just read the question.

(XQ. 225 repeated as above recorded.)

MR. ANDERSON: He used the expression "in a way," and I wanted to know what he meant by that.

MR. KRESEL: Won't you let him read the answer already given?

(Answer to XQ. 225 repeated as above recorded.)

MR. KRESEL: That is all he was doing—fixing the time. Go on, Mr. Parsons.

XQ. 227. Go ahead, now; tell me what you did, please, about the construction of Nitrate Plant No. 1?

A. I was in a limited consultation with him; not going into it deeply at that time at all, with reference to the engineering of Plant No. 1 itself, that portion of the plant; but during those days and earlier I had had definitely assigned to me one portion of the work which was being carried on in Plant No. 1, and that was the development of the methods for the oxidation of ammonia, the experimental work for which and the first plant for which was built under the joint direction of Col. Joyes and myself at Syracuse. Certain officers had been assigned to me to assist in that work. When the experimental part of that work was completed at Syracuse—successfully completed—developing new processes for the oxidation of ammonia, processes which are used today——

XQ. 228. Now then, I asked you about Plant No. 1?

A. This is Plant No. 1.

XQ. 229. Hold on just one minute; I asked you about Plant No. 1 at Sheffield, Alabama, what you did about that plant. I did not ask you about Syracuse?

A. This is the development for Plant No. 1, and it was installed in Plant No. 1.

XQ. 230. Just what you did for installing it in Plant No. 1. I am narrowing it now to Plant No. 1?

A. I developed this process.

XQ. 231. Where?

A. At Syracuse, New York.

XQ. 232. I asked you what you did in the construction of Plant No. 1, not the Syracuse plant?

A. I did not do anything in the construction of Plant No. 1, except to visit it in my capacity as a member of the Nitrate Commission, and in my advice at various times with reference to whether the process should be used in other plants or not.

XQ. 233. Then the last answer is all you did as to Plant No. 1 at Sheffield, is that true?

A. Correct.

XQ. 234. We will follow on a little further. You continued in the Bureau of Mines until 1919, what month did you say?

A. My work closed on the 1st of November. The last month, I think, was given to me as a vacation; practically closed on the 1st of October.

XQ. 235. 1919. Where did you go then?

A. I stayed in Washington as a consulting chemist, as I am today. I opened my own office.

XQ. 236. How long did you continue there as a consulting chemist? Ever since that time?

A. Ever since that time.

XQ. 237. When did you become connected with the General Chemical Company or the Atmospheric Nitrogen Company, which you testified had a plant at Syracuse?

A. April, 1920.

XQ. 238. In what capacity were you connected with that company?

A. As consulting chemist.

XQ. 239. Were you at Syracuse during that time?

A. I was.

XQ. 240. All the time, or what portion of the time?

A. Very little. I was in Washington most of the time, consulting chiefly with the general manager of the company.

XQ. 241. How long did you occupy that position with the Atmospheric Nitrogen Company, or the General Chemical Company, or the Semet-Solvay Company, or whichever it was?

A. Until the plant started active operation in August, 1921.

XQ. 242. You then discontinued your connection with the Atmospheric Nitrogen Company, did you?

A. Yes.

XQ. 243. What has been your position since that time, if any, in connection with this fixation of nitrogen, or your connection with that work?

A. No official connection. I made, as I stated in my previous testimony, one or two written reports as to what I thought of the nitrogen situation—one or two companies who were considering as to whether they would go into it or not; but they were simply the ordinary reports which were of a general survey character.

XQ. 244. What is your present position in connection with the American Chemical Company?

A. I am Secretary of the American Chemical Society.

XQ. 245. Will you tell me just what that organization is, Doctor, a little more specifically?

A. The American Chemical Society is an organization of some 14,500 chemists of America who have joined together for the development of chemistry and the advancement of the chemical industry. It is quite comparable with the Society of Mechanical Engineers and the Society of Civil Engineers.

XQ. 246. If you will pardon me, I did not ask you about the Society of the Mechanical Engineers and the others, but only about this American Chemical Society.

A. I was trying to explain to you what the society is, as near as I am able to do so.

XQ. 247. But in order to get that explanation I would have to examine you about those others.

A. I suppose so.

XQ. 248. You say the membership of this Society is about 14,000 of the chemists of the United States; is that true?

A. Yes, sir.

XQ. 249. Where is your office as Secretary of that association?

A. In the Mills Building, at Washington.

XQ. 250. How long have you been Secretary of that Society?

A. Since 1907.

XQ. 251. Have you any connection now with the Government of the United States?

A. Yes.

XQ. 252. In what capacity?

A. I have been carried on the books of the Bureau of Mines as a consulting chemist to be consulted at the rate of ten dollars a day when wanted, since I left there.

XQ. 253. Have you been consulted?

A. I think I put in five days' work for them while I was abroad once, to find out something about the method of using oxygen and liquid air.

XQ. 254. I asked you whether you had been consulted, and that answer requires yes or no.

A. Yes.

XQ. 255. I understood you to say that as far as you can now recall you put in five days; is that correct?

A. Correct.

XQ. 256. You said you went abroad again during the year 1920 or 1921, did you not?

A. I was abroad in the summer of 1919, I was abroad in the summer of 1920, and I was abroad in the summer of 1922.

XQ. 257. In the summer of 1919 you were still in the Government service?

A. I was. Just a moment, I may have those dates wrong. Yes, that is correct.

XQ. 258. Were you sent abroad by the Government then?

A. I was not.

XQ. 259. You went in a purely personal capacity?

A. I did.

XQ. 260. How long were you abroad at that time, Doctor?

A. My memory is that I was abroad about six weeks. I went on a leave of absence at my own expense.

XQ. 261. In 1920 you were abroad again. At that time you were the consulting chemist of the Atmospheric Nitrogen Company?

A. Correct.

XQ. 262. Did you go abroad as their representative?

A. I did not.

XQ. 263. Did you then undertake to investigate the fixation of nitrogen situation abroad?

A. I did.

XQ. 264. Did you confer with the same people that you conferred with when you were over there in 1916?

A. Many of them.

XQ. 265. Did you have ready access to their records and plants?

A. The only plant that I went into, or the only record I saw, as such, was the Claude plant some forty miles out of Paris.

XQ. 266. That was the French plant, was it?

A. Yes.

XQ. 267. You went abroad again in 1922?

A. Yes.

XQ. 268. Was that in connection with Government service in any way?

A. It was not.

XQ. 269. I believe you in a former answer said something about reporting to the Government on something abroad? On what trip was that that you made the report to the Government?

A. The only report that I ever made to the Government from abroad was the 1916 report.

XQ. 270. You are still the Secretary of the American Chemical Society?

A. I would like to modify that last statement so as to be absolutely accurate. That five days' work that I spoke to you about with reference to the use of oxygen in explosives was done while I was abroad at that time.

XQ. 271. Which year?

A. 1920, I think. I was simply asked as a mining engineer of the Bureau of Mines to find out what I could about that for them, in Germany. Yes, it was in 1920. And the fee that I put in, the five dollars, was simply to cover my railroad and hotel expenses to get to the place to find out.

XQ. 272. Doctor, your only two official positions, then, that have any bearing upon these matters at the present time, are that you are President of the American Chemical Society and you are technically on the list or the roll of the Interior Department in the consulting capacity which you have mentioned; is that true?

A. Those are the only two official positions that I have which I can see have any bearing at all on anything here.

XQ. 273. You said you had something to do with the construction of Nitrate Plant No. 1. Are you familiar with the contract between the General Chemical Company and the United States for the construc-

tion of that plant dated the 30th day of September, 1917?

A. Reasonably so.

XQ. 274. On Friday counsel for the defendant read into evidence a proposition from the General Chemical Company dated June 5th, 1917, addressed to the president and signed by W. H. Nichols, Chairman of the Board, and had you identify that? You recall that, do you not?

A. I do.

XQ. 275. I would ask you to look at the paper immediately following that in the report of the proceedings before the Committee on Expenditures in the War Department, Volume 3, page 2710, the paper introduced by counsel for the defendant being at page 2709, and I will ask you if that is, so far as you can tell, a true copy of the contract between that company and the United States.

MR. KRESEL: What page is that?

MR. ANDERSON: I do not think it is necessary, because this is agreed upon by stipulation, I think, is it not?

A. I have reason to believe so. I never compared it.

MR. ANDERSON: Under the stipulation, if your Honor please, the authenticity of these documents is admitted. I would therefore ask leave in order to complete the record on this point, to introduce in evidence a contract between the General Chemical Company and the United States of America, dated the 30th day of September, 1917, found at pages 2710 to 2712 of Volume 3 of the Hearings before the Committee on Expenditures of the War Department, as Plaintiff's Exhibit No. 651.

MR. KRESEL: There is no objection to that of course; but, Colonel, you do not mean to say that is the agreement between the General Chemi-

cal Company and the Government for the erection of the plant?

MR. ANDERSON: No.

MR. KRESEL: That is only a contract with reference to the Government taking over some contracts that the General Chemical Company had made for supplies, the total amounting to about $21,000.

MR. ANDERSON: That is true, sir, and there was a subsequent contract made, as I understand it, between the Chemical Construction Company of Charlotte, North Carolina, and the Government of the United States for the specific construction of the plant.

MR. KRESEL: I know nothing about that.

MR. ANDERSON: Which I will be glad to introduce in evidence.

MR. KRESEL: If you have that contract I have no objection to having it go in.

MR. ANDERSON: But this immediately follows the preceding paper and I would like to put this in now.

THE COURT: It will be marked.

Received in evidence and marked "Plaintiff's Exhibit No. 651." (*See Exhibits, Vol. III, page 1582.*)

MR. ANDERSON: I offer in evidence contract dated the 30th day of January, 1918, entitled, "Contract No. T14 made by the Chief of Ordnance with the Chemical Construction Company of Charlotte, North Carolina, for nitric acid recovery plant"—sub-heading, "For Construction of United States Nitric Plant No. 1," which contract will be found at pages 2619 to 2627 of the document entitled, "Hearings before the Committee on War Expenditures, September 3rd,

1920," to be identified and read into evidence as Plaintiff's Exhibit No. 652.

MR. KRESEL: You know, Colonel Anderson, that this is a contract for the construction of a very small portion of the plant only. That is not the main contract.

MR. ANDERSON: If your Honor please, counsel introduced in evidence this morning evidence of the cost of the plant. I do not controvert that in the slightest because that is a matter of record at a dozen places. That there were additions undoubtedly to the plant from time to time I do not question, but I introduce this contract to show the conditions under which the work was undertaken and the limitations imposed by the contract upon the respective parties. Those terms, so far as I know, were not varied during the term of the contract.

MR. KRESEL: Colonel Anderson, I am very sure you want to give the Court the benefit of everything that there is.

MR. ANDERSON: I do not think it is necessary to state that.

MR. KRESEL: This is a contract for only one portion of the plant, and it is the smallest portion. The contract for the big construction was with the J. G. White Company and not this company at all.

MR. ANDERSON: If counsel will put his hand on the contract to which he refers, I will introduce it as a Plaintiff's Exhibit.

MR. KRESEL: I simply did not want you to be under any misapprehension.

MR. ANDERSON: In order that your Honor may understand—I do not want to read this because it takes a lot of time—your Honor will find in these contracts substantially the same pro-

vision for secrecy as to processes and persons going into the plants and the rights of parties and the preservation of secrecy that I suppose is found in every contract for the construction and operation of a plant embodying the use of patents and processes; and I am introducing this to show that the General Chemical Company itself, although it assumed the full responsibility for the construction of that plant, imposed upon the Government of the United States and its officers an obligation to maintain secrecy, which was an entirely proper and appropriate obligation.

In addition to that I want to be able, should I deem it necessary, to use the terms of that contract to point out just the obligations and rights of the respective parties. I am perfectly willing to put in any contract or all contracts in evidence that tend to show that.

MR. KRESEL: As I say to your Honor, I have no objection to this contract going in evidence. I think Colonel Anderson is in error. This contract has nothing to do with secrets at all. You will not find anything there about people not going into the plant. It has nothing to do with any patents. This was a contract for the construction of only one portion of the plant which is called the nitric acid recovery plant, which is the least important of the whole works. I think, Colonel, you will look in vain there for any provision about secrecy or patents.

MR. ANDERSON: If they haven't got it there, we will put in another one.

THE COURT: But if this is not the contract you had in mind, would it not be well to withdraw your offer, or are you sure that this is the one you did want to put in?

MR. ANDERSON: This is one of the contracts I

want to put in. I have a note of it here. If there are others, I will put them in. I think the two I put in sufficiently support my statement. If I find there are others, I will ask leave to put them in in rebuttal.

MR. KRESEL: If you are satisfied, all right.

MR. ANDERSON: I am merely now putting it in so that the Court will have the whole thing, so far as I can get it.

THE COURT: If you are offering this for the purpose mentioned and counsel on the other side, who I assume is familiar with it, says there is nothing in that contract with respect to those matters, I did not suppose that you wanted to put it in.

MR. ANDERSON: Your Honor probably has observed that counsel on the other side, with all deference to him, and I do not always agree in this case.

THE COURT: I thought you did agree as to the literal contents of a document but not as to the meaning.

Contract referred to received in evidence and marked "Plaintiff's Exhibit No. 652." (*See Exhibits, Vol. III, page 1589.*)

THE WITNESS: Your Honor, I made a statement a moment ago that might possibly not be considered complete and I am extremely anxious that everything I say shall be complete. Counsel asked me as to whether I had any other official connection. About two weeks ago, I accepted a retainer from the Nitrogen Products Company of Providence with reference to some work that they have to do on a cyanide method that has no connection with this case at all, so far as I myself can see, but I do not wish to make any misstatements.

XQ. 276. What was the name of the company?

A. Nitrogen Products Company of Providence, Rhode Island, on their cyanide Buecher patents.

XQ. 277. Now, Dr. Parsons, turning to your report of April 30, 1917, at page 17 thereof, I would call your attention to the language in the last two paragraphs of the first section of that report, in which you say:

> "At the time my preliminary report was written, I felt even more confidently than I was willing to express that the Haber process or the cyanide process would be shortly available for the use of this country and would largely if not entirely displace the arc and cyanamid processes which requires large electrical development and a correspondingly large expenditure. Development has been rapid during the last two months. A synthetic ammonia process and a cyanide process have now reached a state of development where I am prepared to recommend definite action to the Government."

I have read your statement correctly, have I not?

A. You have.

XQ. 278. At a later stage in that report, you have set forth the estimates of the cost of operation at page 19, and on page 18 you have discussed the details entering into expenses and overhead. You are familiar with that, are you not?

A. Yes.

XQ. 279. This morning I think you made the statement that your references earlier in the report to the cost of producing ammonia by the synthetic process of four cents had reference to Germany?

A. Not earlier in the report, but in my previous report.

XQ. 280. Did you not when you wrote this final report have in your possession an estimate of the

cost of producing synthetic ammonia in the United States?

A. Yes, when I had the second report; not the first.

XQ. 281. And is it not a fact that that estimate arrived at a cost of producing synthetic ammonia in the United States of approximately four cents a pound?

A. I think that is correct. I would have to go to the report to be certain, but my memory is that that is essentially true.

XQ. 282. Now then, whatever may have been your reference in this first report to the cost of four cents, at the time you made the second report you had in your possession an actual estimate showing the cost of producing synthetic ammonia by the Haber process, a slightly modified process as you spoke of it this morning, in America, of four cents a pound, did you not?

A. By the General Chemical Company's process, an entirely different process.

XQ. 283. All right, we will see about that entirely different process. But you did have an estimate?

A. I did.

XQ. 284. And you told the Government of the United States officially that the cost of producing synthetic ammonia in the United States by, we will say, the modified process of the General Chemical Company would be four cents a pound, did you not?

A. You have my exact figures on page 19.

XQ. 285. Haven't I stated them substantially correct?

A. No, it is nearly five cents for the operating costs alone. It is $97 a ton for the operating costs alone; $300 a ton for nitrogen fixed for investment. My own estimate was considerably over four cents a pound at that time.

XQ. 286. Did you not have in your possession at

that time, and base your report upon, that letter (handing paper to witness)?

A. This is addressed to me, isn't it?

XQ. 287. It certainly is.

A. This was one of the most confidential communications that was given to the Government during the war. I have never quoted it to anyone; and I think——

XQ. 288. Now, Doctor, one minute.

MR. KRESEL: I think he should be permitted to finish his answer.

XQ. 289. I want an answer to the question. Did you not in fact base your statement in that report of cost on that letter and didn't you have it in your possession when you wrote that report? I want an answer yes or no.

MR. KRESEL: Wait a minute, please, do not get excited.

MR. ANDERSON: I do not get excited.

MR. KRESEL: I object to counsel interrupting the witness in the middle of an answer. If the answer is not responsive, he has his remedy to move to strike it out. I insist that the witness be permitted to finish his answer. Now, will your Honor permit the reading of so much of it as has already been given? (Answer to XQ. 286 repeated by the Stenographer as recorded.)

MR. ANDERSON: Now, I move to strike that out, because it is not responsive to the question, and ask for an answer to my question; and in reply to counsel I will say that I have a right to stop a witness when he begins to argue the case from the witness's stand, and I demand an answer to my question.

MR. KRESEL: I must say, your Honor, that I

do not see that the witness has undertaken to argue with counsel.

MR. ANDERSON: Possibly counsel does not, but I have to do the examination as best I can, even if it contravenes his views on the subject.

THE COURT: The motion to strike out is granted. The question may be repeated.

XQ. 290. Did not you have in your possession at that time, and base your report upon that letter?

A. I had it in my possession and I largely based my report upon it?

MR. ANDERSON: Then I will ask leave to introduce in evidence a letter upon the letter-head of the General Chemical Company, dated April 30, 1917, addressed to Dr. Chas. L. Parsons, signed "General Chemical Company, Frederick W. de Jahn," and that I wish to read.

MR. KRESEL: Inasmuch as some question of confidence has been raised with reference to this letter, your Honor, this is the first time that I have ever heard of this letter, and I would like permission if counsel on the other side will not let the witness state the facts, I would like permission now to ask the witness a question with reference to this letter.

THE COURT: You may.

MR. KRESEL: So that I may govern myself with reference to it.

By MR. KRESEL:

Q. 291. Dr. Parsons, you started to say something about how this letter came to you, and what you did with it. Will you please make the statement?

A. In connection with my report, I had gone to the General Chemical Company to get data which I referred to in the early portion of this report, which he asked me to write. I had it intimated to me a few

weeks before, that they were carrying on experimentation, and they would let me have it, and they were getting results which they considered most excellent. I was in conference with him two or three times, trying to persuade him to let me have the data for the Government to use. They finally consented to give me that data and to give me the costs, on my definite promise that it would be kept strictly confidential and provided for the Government's use, and I was to transmit it to the War Department.

MR. KRESEL: Now, your Honor, of course I have no understanding here to represent the General Chemical Company, and can not plead its confidence in the matter; but the facts are before your Honor, and it is for your Honor to say, whether under those circumstances, the information having been obtained by a Government official under the strict promise of secrecy, whether it is necessary to spread that upon the records of this Court.

MR. ANDERSON: If your Honor please, the information is dated April 30, 1917. It is almost identical with the information given in the published report by this witness; and in the published report of this witness, he refers to the activities of the General Chemical Company in the development of this process and the estimated cost of the production of this material, and there is not the slightest indication upon the letter or anything on the correspondence, that I have ever seen, or in the use of the data given in that report, that is in any sense confidential.

MR. KRESEL: Your Honor will see by the report that it does not quote any information as coming from the General Chemical Company. It is an estimate made by the witness for the benefit of the War Department. I do not think——

THE COURT: So far as I can see, the burden of the disclosure is upon the plaintiff. It is produced here from its files, if it was given under a pledge of secrecy, and the Government still offers it——

MR. KRESEL: That is up to the Government.

THE COURT: That is up to the Government.

MR. ANDERSON: And the Government assumes that obligation.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 653." (*See Exhibits, Vol. III, page 1610.*)

XQ. 292. Now, this letter states as follows: (Reading from Plaintiff's Exhibit No. 653.)

MR. KRESEL: I do not think that is necessary to go into the record.

XQ. 293. You do know, as a matter of fact, that within a few months after April, 1917, the Government of the United States entered into contracts for the construction of Nitrate Plant No. 1 at Sheffield; is that not true?

A. Yes.

XQ. 294. And for the construction thereof on the General Chemical Company's modification of the Haber process; is that not true?

A. On the General Chemical Company's process, yes.

XQ. 295. To what extent had the General Chemical Company developed any plant in the United States for the use of that process?

A. They had at Laurel Hill, Long Island, a small laboratory plant which could produce a few pounds of ammonia a day. They had, further, at that time drawn plans which are mentioned in the various reports you have before you, for a plant which they themselves intended to erect to operate commercially

by this process, and they had placed orders for material, apparatus for that plant, to something over a million dollars, I do not know exactly what it is, which material and contracts were turned over to the Government at the time the contract for building Plant No. 1 was signed or shortly afterward.

XQ. 296. Is it not a fact that the record to which you have referred and the contracts to which you refer state that the General Chemical Company did not contemplate construction of plant on account of war conditions and the cost of the construction, until the war was over?

A. I am not sure. They may have.

XQ. 297. And that is the full extent to which the General Chemical Company had developed any process such as you have stated, is it?

A. Yes.

XQ. 298. And on that basis of experiment and information I believe you said that the Government, acting under a board of which you were a member and on which you were active in the manner you have described, undertook the construction of a plant for the use of the synthetic ammonia process which cost over thirteen million dollars before they got through with it; is that true?

A. No.

XQ. 299. Well, what did it cost before they got through with it—twelve million?

A. That portion of the plant cost approximately seven million.

XQ. 300. I believe, Dr. Parsons, as you said, you testified and some of your evidence was referred to in the hearing before the Committee on Expenditures of the War Department held in 1920; is that true?

A. I did.

XQ. 301. At page 2598 of the report of these hearings I wish to read you your statement, and I will

follow with others. If you wish a copy of the book, that you may verify them, I shall be glad to have you take one. The first is by Mr. Graham. Mr. Graham was chairman of that committee, was he not?

A. He was.

MR. ANDERSON: Would your Honor like a copy of the book?

THE COURT: No, perhaps the witness wants one.

THE WITNESS: No, I think I can tell from his reading of it.

MR. KRESEL: The copy I have is the only one in our possession, and I think I better keep it.

XQ. 302. (Reading)

"MR. GRAHAM: What were your conclusions, from your inspection of the plants in Europe, Dr Parsons? Can you tell us in a general way, about the processes you examined and what the various points were, so that we will have an idea in a rudimentary form of the situation as you saw it?

"DR. PARSONS: It would take quite a little while to go into the details of the report, though possibly I can summarize it: I viewed the cyanamid process, as it was used in Italy, Norway, and Sweden, having seen it in this country before I left. I went to the arc process plants in Norway, and to a small arc process plant that had been constructed in the southern part of France in the Pyrenees Mountains, near the border of Spain. I got such information as I could in regard to the Haber process, which was being used in Germany, and having come back to this country I also saw the synthetic ammonia process, which was in some respects similar to the Haber process, which had been partially developed here by the General Chemical Co. The general result of my report was that hydro-electric power was not essential for the fixation of nitrogen, and that the process which would undoubtedly be the process

of the future was the process for the production of ammonia by the direct combination of nitrogen and hydrogen, which in Germany is known as the Haber process, and in this country has been known as the General Chemical Co.'s process, they working at low temperature and using a different catalyst.

"Since that time we have much further information, and I am of the same opinion today, and it has been justified, I think, by the development in Germany. The Haber process in Germany, starting at the beginning of the war with an output of some 7,500 tons of ammonia—Germany would never have gone to war if she had not had the Haber process—so developed that in 1918 they produced in two plants something like 250,000 tons of ammonia. The process was producing twice as much as any other process in Germany, and about as much as all of the others put together, although the others had been developed at the same time to a considerable extent. The actual reported output that has come to us at the German plants—I have been over there again this last year—is 25,000 tons of combined nitrogen by the Haber process, which is equivalent to about 255,000 tons of ammonia, or 1,000,000 tons of ammonium sulphate. That was their output in 1918 from two plants, one at Oppau and the other at Merseburg."

Did you so testify, Doctor?

A. I did.

XQ. 303. At pages 2600 and 2601 of the same report. I read the following:

"MR. GRAHAM: Perhaps that is very true, Doctor, now tell us in a general way about this Haber process; what is it?

"DR. PARSONS: The Haber process is a process by which nitrogen and hydrogen are made to combine directly to form ammonia in the presence of a special catalyst, which is certainly well-known now by everybody to be a modified form of iron

especially produced in porous form. Under a pressure of about 200 atmospheres, and a temperature of about 550 degrees centigrade these two elements combine together to form ammonia, which is the basic material which we need for fertilizer purposes, and from which nitric acid can be made for war purposes.

"MR. GRAHAM: Do you understand the method of making containers that hold this material under these pressures?

"DR. PARSONS: Not perfectly; no. But I have not any doubt whatever that Haber plants will be operating in the United States within a comparatively short period of time. More information is being obtained daily with reference to it, and I have no doubt that complete information will be in hand shortly. I have no doubt also that there will be improvements in the process right straight along, as there will be in all processes. I think that a plant could be built in a comparatively short time and enlarged as rapidly as any other commercial plant of that kind could be and that it will operate successfully in this country."

Further down, after some intermediate questions Mr. Graham asked:

"MR. GRAHAM: Do you know anything about how expensive the operation of those German plants were?

"DR. PARSONS: Nothing absolutely definite. We understand that the plant on which Lieut. McConnell reported—at Merseburg, probably cost about 19,000,000 Marks, and he thought it could be reproduced in this country for about $25,000,000 to $50,000,000. That made 90,000 tons of combined nitrogen in the form of ammonia per year.

"MR. GRAHAM: Is it operated by hydroelectric power or coal?

"DR. PARSONS: Coal. The Haber process requires very little power. In my opinion, the processes that are going to be used mostly in the future will require very little power. There are

very extensive reports made out on those in England that are in printed form.

"MR. GRAHAM: Where are they?

"DR. PARSONS: I have one at home, and Col. Joyes has one of them. There are but two in this country, so far as I know.

"MR. GRAHAM: Does it require much heat? Of course, you spoke of 550 degrees centigrade.

"DR. PARSONS: Not a very great consumption of heat, no; nor a great consumption of coal. It requires high pressure. It requires very pure gases. The greatest difficulty in the whole situation is to produce pure hydrogen; that is to purify the ordinary hydrogen after it is made so that it can be used in the process. The hydrogen is a large part of the cost—that and the installation cost.

"MR. GRAHAM: The operation cost is small?

"DR. PARSONS: The operation cost is comparatively small.

"MR. GRAHAM: How does it compare with the operation cost in the cyanamid process?

"DR. PARSONS: Personally, I have no doubt whatever,—of course, people will differ from me, especially people who are interested—that ammonia can be made cheaper by the Haber process than by any other process; and the reports from abroad—for example, the English reports—bear that out. Their estimated costs are quite a little lower.

"MR. GRAHAM: Do you know, Dr. Parsons, of your own knowledge whether there are plans under way for the production of ammonia in this country by that process?"

Further down you were asked by Mr. Graham with respect to the English report:

"MR. GRAHAM: You say Col. Joyes has one of those?

"DR. PARSONS: I have one and I think Col. Joyes has one. (To Col. Joyes.) You have that

thick report of the M. I. D. in England, giving all the costs of the various processes?

"Col. Joyes: Yes, sir."

You so testified before that committee, did you not, as I have read your testimony?

A. As far as you have read it, it is correct.

XQ. 304. Dr. Parsons, you have referred twice in the testimony which I read to a report of the English Committee, and I find at page 3766 of this same volume of Hearings before the Graham Committee, the report of the Minister of Munitions, Munition Invention Department, which is "M. I. D.," of course, final report of the Nitrogen Products Committee. Is that the report to which you referred?

A. Yes.

Mr. Anderson: I offer in evidence the report of the English Committee to which the witness has referred and which he has identified, as found in the volume of Hearings before the so-called Graham Committee, to which I have already referred, at pages 3766 to 3771, inclusive, to be read as Plaintiff's Exhibit No. 654.

Mr. Kresel: I have no objection, your Honor.

The Court: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 654." (*See Exhibits, Vol. III, page 1612.*)

XQ. 305. I again read to you from the same volume, which I will not describe, on page 2613, question by Mr. Graham.

Mr. Anderson: For the information of the Court, and to connect up, I will say they were discussing the two plants at Muscle Shoals, and the witness was first asked if he would recommend the perpetual maintenance of plant No. 1, and he said he would prefer not to answer, because of the differences of opinion. Then Mr. Graham asked:

"MR. GRAHAM: I do not care how many do not agree with you, so far as I am concerned. We will give them an opportunity to express their opinions.

"DR. PARSONS: I, personally, do not believe that the cyanamid process will be able to compete at all with other processes a few years hence."

You so testified, did you not?

A. I did and I believe so today.

XQ. 306. Then further down on the same page Mr. Graham asked in connection with the two processes:

"MR. GRAHAM: What about the number of people that are required to operate the two processes, in comparison?

"DR. PARSONS: The labor in the Haber process is supposed to be considerably less.

"The difficulties of the Haber process have been the difficulties which come from high pressures and temperatures and the mechanical difficulty of making machines which will stand these pressures, also the purification of the gases is expensive.

"There have been some new developments in Germany, which we have not known more than about five months—were only found out since the war closed—which are going to very greatly cheapen the Haber process over the estimates which we have previously made. Some large companies abroad and in this country are seriously considering going into the manufacture—not only 'considering,' but arranging to go into the Haber process on a large scale.

"MR. GRAHAM: I assume that the Haber processes are all patented?

"DR. PARSONS: They are patented; yes. But we have the patents under The Chemical Foundation; they have all been taken over and are all available to American manufacturers."

You so testified, did you not?

A. I did.

MR. ANDERSON: To the end that it may not be suggested I have not given his answers fairly, I will read a little further, because I notice that at the bottom of the page the discussion is continued.

XQ. 307. I read as follows:

"MR. GRAHAM: You mean that under the Alien Property Custodian they have been sold here?

"DR. PARSONS: No; they are available to any American corporation that is really an American corporation that wants them.

"MR. GRAHAM: Will that be true after the treaty of peace is signed?

"DR. PARSONS: Absolutely. According to the charter of The Chemical Foundation, any company that is sound financially and is truly American can get the use of those patents under the same rates and conditions as any other. They will be available for use and are now available for use. Furthermore, we have a large part of the information in regard to the operation of the plant, and I do not anticipate the slightest difficulty; in fact, I think I might state here that I hope to be more or less connected with this myself, and, therefore, you must consider that I would be in favor of the Haber process at the present time, being somewhat partisan. But I have always been in favor of it.

"MR. GRAHAM: Where are you now, Doctor?

"DR. PARSONS: I am secretary of the American Chemical Society, and I am doing consulting work. My address is 1709 G Street, Washington, D. C.

"MR. JEFFERIS: (Of the Committee) You feel, then, Doctor, that if the Government undertook to operate these plants down there in competition with the plants constructed on the Haber process,

the Government would not necessarily run you out of business?

"DR. PARSONS: Would not run the Haber process out?

"MR. JEFFERIS: Yes.

"DR. PARSONS: No; I do not think they would run the Haber process out at all. Not at least if they sell at cost. If they count out the $60,000,000 capital, have nothing to pay on it, and do not have to pay dividends on any of the investment, why, I think even then you can not run them out. I do not think the people interested in the Haber process are worrying about it a bit, any more than they are in Germany."

You so testified, did you not?

A. I did.

XQ. 308. Doctor, I think you stated this morning that you also testified before a Committee on Military Affairs of the House of Representatives, which had under consideration the matter of disposition of the Muscle Shoals properties, including the proposition of Mr. Ford. Do you recall that?

A. Yes, I have testified on it. You will find about a half a dozen more. I have testified every time it has been before Congress, with the exception of the time it was before the Senate Committee, which was the only committee that did not themselves request me to come before them and testify on this matter.

XQ. 309. We will see if we can find them all before we get through.

A. I will turn them over to you. I have them here. You will find my testimony consistent throughout.

XQ. 310. You will leave that for me to discuss, won't you?

A. (No answer.)

XQ. 311. If you will turn to page 1116 of your statement before the House Committee on Military Affairs, to which I will refer as the volume on Muscle

Shoals Propositions, I find the following attributed to you. I am now reading from the opening part of your statement:

"There is one thing that I ought to mention. I have been, I think, before every committee that has had this matter up for consideration. I was, after I left the Bureau of Mines in the latter part of 1919, connected in a consulting chemical capacity with the Atmospheric Nitrogen Corporation, whose plant is now operating at Syracuse; I remained with them in a consulting capacity until August 15, 1921, when their plant was in full, successful operation, and my connection with them ceased with the understanding that I was entirely free thereafter, and I am before you as a free lance, without anyone influencing my testimony.

"THE CHAIRMAN: That plant at Syracuse is the one that has been referred to as the fixation plant No. 1, which is different from the plants operated by the cyanamid process?

"DR. PARSONS: You are correct.

"THE CHAIRMAN: What is the name of that process officially?

"DR. PARSONS: It is generally spoken of as the General Chemical Co.'s process, or, if you wish to go back to a more general term, it is a modification of the Haber process. There are three modifications of the Haber process, which differ slightly, and which I will explain.

"The Haber process was first developed in Germany. When the war began they were making 7,000 tons of fixed nitrogen per year by the Haber process there. Their patents called for operation under pressure from 100 atmospheres to 300 atmospheres, or to put it in pounds, from 1,500 pounds per square inch to 4,500 pounds per square inch—very high pressures.

"The process consists in the direct combination of nitrogen and hydrogen to form ammonia, and the greatest difficulty in the process today is to procure the hydrogen and to procure it cheap. Modifications of that process have been devised,

but information could not be obtained in 1917 from Germany which would enable us to put in the German process *per se.*

"The General Chemical Co., in order to be free from the German patents, devised a process which worked at a pressure of 1,500 pounds per square inch. In France Claude has devised a process which works at pressures greater than 300 atmospheres, in fact, he works at pressures of 900 atmospheres, which would be nine times 1,500 pounds per square inch—a very, very high pressure. He is working on a comparatively small scale, but successfully, in France. Otherwise those processes are much alike, and they are often spoken of in the general term as the Haber process. It is really the synthetic ammonia process, of which there are three modifications used in the world today. They are replacing the other processes, and, so far as we can now see, within a few years this will be used for nitrogen fixation.

"THE CHAIRMAN: Did you do anything at Muscle Shoals with regard to nitrate plant No. 2?

"DR. PARSONS: With reference to nitrate plant No. 2, I was called into the first conference in General Crozier's office, and the details in that conference are set forth in the records of Mr. Graham's committee. I differed from nearly everyone else there that night as to the advisability of installing plant No. 2 at all. I went back the next day and wrote a letter to General Crozier giving my full opinion and reasons therefor and mailed it to him, and after that I had nothing to do with plant No. 2.

"THE CHAIRMAN: What was your objection to that plant?"

The Plant No. 2, Doctor, was the cyanamid plant, was it not?

A. The cyanamid plant.

XQ. 312. (Reading):

"DR. PARSONS: My objection to that plant

was that it was a process that was becoming obsolescent. I did not feel at that time we had reached a stage where the installation of the plant was necessary for war purposes. I believed we could procure our immediate needs from the ammonia produced by the destructive distillation of coal, of which we are making something like 100,000 tons every year, and at that time, if I remember correctly, about 70,000 tons, and I thought that ammonia could be diverted temporarily without injury to the other industries of the country and could be oxidized and made into the nitric acid that we might need for any short period of emergency. So I favored installing at first the process of the General Chemical Co., a modification of the Haber process, and installing it as a small unit so we could determine how it would operate and the necessary details for its operation. I will have more to say about that later."

That is your testimony, is it not?

A. Correct, and corroborated.

XQ. 313. On page 1121, the Chairman asked:

"THE CHAIRMAN: Have you any opinion about the cyanamid process yourself?

"DR. PARSONS: I have been through a number of plants; all there are in this country and several in Europe. I made a very careful study of the process and its operation.

"THE CHAIRMAN: Do you think that it is likely to be superseded by new inventions or new processes?

"DR. PARSONS: I think it is practically already superseded by the Haber process and its modifications, and on that I can give you some very definite data. The cyanamid plant in Canada is practically shut down. It is producing no cyanamid, or very little cyanamid, for fertilizer. The cyanamid plants in Italy are closed. The cyanamid plants in France are closed. The cyanamid plants in Dalmatia and Silesia are

closed. The cyanamid plants in Norway and Sweden are closed. The large cyanamid plant at Odda, Norway, which I had the pleasure of visiting in 1916, and which is fully equal to the Muscle Shoals plant in quality, and one of the best constructive plants I ever investigated. It is not quite one-half the size of the Muscle Shoals plant, is now closed, and has been sold at auction within the last month for $10,000, or rather 50,000 kronen."

You so testified, did you not?

A. I did.

MR. KRESEL: Will you tell me the page that was on?

MR. ANDERSON: That was at page 1121, sir.

XQ. 314. At page 1124, they were discussing the cyanamid plants and some statement was referred to. Mr. Stahl of the Committee asked you who made that statement and you replied "Mr. Worthington." Now, if I may pause a minute, Mr. Worthington is the President of the American Cyanamid Company, is he not?

A. No, sir.

XQ. 315. What is his position?

A. I do not know. I do not think he has any.

XQ. 316. What was his position at that time?

A. He never admitted any position. He was apparently a lobbyist for somebody in Alabama trying to get this Bill through Congress or trying to assist in the passage of the Bill. I do not know that he has ever admitted any position to anybody except that he wanted to get it through. He definitely stated he had no connection with the American Cyanamid Company.

XQ. 317. And then you answered:

"MR. WORTHINGTON: That is, the paper says he did. I do not know. They make their hydrogen at Syracuse by exactly the same process or essen-

tially the same process that they make it in Germany, from coal by the action of carbon on water and steam and that is why the big steam plant was put in at Plant No. 1. Plant No. 1 at Muscle Shoals was put in as an experimental plant on a small scale in order to get the necessary information to increase it in size. It was started on the basis of 22,000 tons of ammonium nitrate per year. However, only one unit of approximately one-third or a little more of that plant was constructed. It was just one-fifth the size of the other plant contemplated. However, only one of the units was put in in order to get information to build the rest of the plant. They only had a very short time after that unit was completed to get data on operations. They found difficulties exactly as the Germans found when they first ran their Haber plants on the other side in the early history of that process. There were great difficulties owing to the high pressures used and the difficulties of preparing the catalyst on a large scale. They could prepare it easily in the laboratory on a small scale. Then the armistice came and the plant was closed down.

"The Ordnance Department tried to make arrangements with the General Chemical Company to go ahead and operate plant No. 1, but they could not come to an agreement largely because the General Chemical Company wanted to get away from any question of Government relationship. Their engineers had claimed that it was the Government engineers that kept it from running right in the first place and the Government engineers claimed that it was their engineers that kept it from running right in the first place and there was no complete agreement between them. Accordingly, the General Chemical Company changed its plans and started to build a new plant by essentially the same process, changing a number of mechanical details for which they had obtained the data in the operation at Muscle Shoals, changing their catalyst and some other details of the plant. Then they built a plant almost imme-

diately at Syracuse, New York, to run by the General Chemical Company's process, running under 100 atmospheres as at Muscle Shoals. That plant was completed in very short order. That plant operated perfectly from the start. So far as I know, it has not closed down a day since it started. It was built on a 10-ton basis and it has been producing over 12 tons a day for several months.

"So that instead of Plant No. 1 being a failure, in my opinion, plant No. 1 has thoroughly justified itself. I have not the slightest doubt that the fixed nitrogen which is to be made in the future in America is going to be made by a synthetic ammonia process, whether it is at Muscle Shoals or wherever it may be, simply for the reason that there is no other process in the world that for a minute can compete with it commercially.

"In Germany the Haber process is operating at full capacity, turning out 300,000 tons of nitrogen per year, about 90,000 tons of which is at Oppau, and the other 210,000 at Merseburg.

"At Oppau there was a terrible explosion, probably the largest that ever occurred, a few months ago. That explosion had absolutely nothing to do with the Haber process. It was an explosion of ammonium nitrate mixed with ammonium sulphate. They had 4,500 tons of that material stored in one building. You have stored at Muscle Shoals today 3,400,000 pounds, or something over 1,500 tons of ammonium nitrate, which would explode itself if it were subjected to the same conditions. That amount of ammonium nitrate which is in storage at Muscle Shoals has been on the market offered for sale within three months, and the highest bid they could get, so far as I have been able to find out, was about three and three-quarter cents a pound and the average was somewhere around three and one-quarter cents, which is a very low price."

Then omitting a paragraph about the explosion, which is not material, I wish to read further:

"The Haber plant over there is again work-

ing. This plant at Oppau, which was supposed to be wiped off the face of the earth, is now, within a few monts after this explosion, producing nitrogen again to capacity, and Germany is turning out something like 2,000,000 tons of ammonium sulphate, or its equivalent, made from air nitrogen, and using most of it in Germany for concentrated fertilization. So that I think there is no question whatsoever as to the future of the Haber process. and I believe, and believe very strongly, that the one possibility of making fertilizer with any degree of cheapness is through the development of plant No. 1 at Muscle Shoals, and that you can never hope to do anything with plant No. 2, and that anybody that runs it will lose money very rapidly."

Was that your testimony?

A. It was; and is.

XQ. 318. Good. Again at page 1129 of the same volume, you were asked by Mr. Miller of the Committee as follows:

"MR. MILLER: You are very much against the cyanamid process, Doctor?

"DOCTOR PARSONS: No; I am not against it.

"MR. MILLER: As compared with the Haber process?

"DOCTOR PARSONS: I think there is absolutely no question but what the Haber process is the process of the future. I have not anything against the cyanamid process except, in my opinion, it is practically obsolescent.

"MR. MILLER: The plant at Syracuse of which you speak is on the Haber process?

"DOCTOR PARSONS: A modification of the Haber process.

"MR. MILLER: Built by the same company, I believe, the General Chemical Company?

"DOCTOR PARSONS: Built by the same company that was in contractual relations with the Government for plant No. 1; yes.

"Mr. Miller: Plant No. 1 is a failure, you say?

"Doctor Parsons: I do not say so; no, sir; I do not consider it a failure at all. I consider it the first trial of a process which has become unusually successful and that they gained the information from it which they hoped to gain from it when they started in.

"Mr. Miller: It was built as a trial plant, then?

"Doctor Parsons: Yes, sir."

Then some further discussion that is not material, and then:

"Mr. Miller: Doctor, there was certainly an impelling force in Congress to enact this legislation when the world was ablaze with war and a great many people of that day and hour believed that ultimately America would get into it. It was cerainly felt that that was an impelling reason with the prospects we had before us. That is the way I view it.

"Doctor Parsons: That plant was built after very careful consideration by the best talent they could get in America to meet the purposes of the national defense act. We were not then in the war. I am wrong; that was determined upon in May of 1917. In the spring of 1917, we were in the war, but there was not any expectation that we would be cut off from Chilean saltpeter or that there would be any such demand for that material. It was in the latter part of that year that the urgency came on, and then they built plant No. 2 as a war emergency, because they knew they had all the data to make it a success from the start. The other plant was built as a semi-commercial trial plant and there is a successful commercial plant in Syracuse today.

"Mr. Miller: You mean the plant in Syracuse was built as a semi-commercial trial plant, or the one at Muscle Shoals?

"Doctor Parsons: The one at Muscle Shoals, which is only about one-third completed; that is, to its full capacity.

"Mr. Miller: It strikes me as rather peculiar and as a rather bad proposition, when we were at war or on the threshold of a war, for anybody to advise the Government of a process for the fixation of nitrogen that they did not know would be a success.

"DOCTOR PARSONS: We knew at that time that that process, or basically the same process, was a very great success in Germany and we thought that it would work more successfully on the start-off than it did, but it was built on a small scale to be sure of that, and with the idea of getting the data and then rapidly increasing it.

"MR. MILLER: Were there any plants then in existence and running to capacity in Norway and Sweden that were using the Haber process?

"DOCTOR PARSONS: No, sir; there was none except in Germany, and we could not get into Germany and get the data. We had to simply take the data which the General Chemical Co. had."

You so testified, did you not?

A. I did, but I think it will have to be explained before you will understand it.

By MR. KRESEL:

Q. 319. You so testified?

A. I so testified.

By MR. ANDERSON:

XQ. 320. I will leave that for your re-direct examination. I am now merely asking you to identify your testimony.

A. I did.

XQ. 321. In connection with your preceding testimony that the Ordnance Department tried to make arrangements with the General Chemical Company to go ahead and operate plant No. 1, but could not come to an agreement, I hand you a memorandum which is signed by the General Chemical Company on that subject and ask if you have ever seen it?

A. I have never seen it, according to my knowledge.

MR. ANDERSON: In order to complete the record, I shall offer that paper in evidence as coming

from the files of the War Department of the United States, sir, an official document.

THE WITNESS: What is the date of that?

MR. KRESEL: April 23, 1919.

THE WITNESS: I think I was on my way to Europe at that time, or I would have received it.

MR. KRESEL: I have not had a chance to look at this, your Honor. Offhand, I should say that a proposed contract between the General Chemical Company and the United States of America, which the United States of America declined to sign is immaterial.

THE COURT: Suppose I get Colonel Anderson to tell me its purpose.

MR. ANDERSON: This morning this gentleman testified on the subject of the relations between the Government and the General Chemical Company. He has testified throughout in a number of instances on that matter.

MR. KRESEL: I do not recall that he has testified anything about the relations between the two parties. Will you tell me what he said?

MR. ANDERSON: I will say that he stated in his testimony on Friday or on Saturday that the Government had entered into a contract with the General Chemical Company——

MR. KRESEL: Which I read in evidence.

MR. ANDERSON: To use the General Chemical Company's process.

MR. KRESEL: Which I read in evidence.

MR. ANDERSON: And that the General Chemical process was the one used at Muscle Shoals.

MR. KRESEL: He did not say that. I read that out of the official report.

MR. ANDERSON: If you read it out of the official report you put it in evidence.

MR. KRESEL: Certainly I did.

MR. ANDERSON: And, further, that the plant No. 1 was in one place claimed to be a failure, and in another place there was evidence somewhat to the same effect. Now I want to put in evidence for the purpose of showing the complete record on plant No. 1 and the relations between the Government and the Chemical Company—I can reserve it for rebuttal if you wish, it is quite agreeable to me—the proposal of the General Chemical Company to take over plant No. 1 at Muscle Shoals, and what the terms of that proposal were, in April, 1919, exactly at the time this transaction took place.

MR. KRESEL: If that is all Colonel Anderson desires to state, it seems to me that statement entirely disposes of his offer; because what the General Chemical Company wanted to do, to which the Government did not agree, is certainly no agreement between the parties, even if such an agreement were binding upon us. Apparently this is simply a proposition made by the General Chemical Company, out of which nothing came—made after the agreement by which we obtained the patents. There is no evidence that we knew anything about it.

MR. ANDERSON: I am perfectly willing to concede it would properly come in rebuttal.

MR. KRESEL: Even so, I am not objecting to it because it is offered at this time. Do not misunderstand me.

MR. ANDERSON: Then I think it is clearly admissible as evidence on those matters.

MR. KRESEL: I am afraid you and I can not agree on it, then.

MR. ANDERSON: I am afraid not.

MR. KRESEL: Certainly an unaccepted offer is no proof of value; is it?

THE COURT: I am not sure, Colonel Anderson, that I have your thoughts very clearly in mind, but we will admit it under the General Rule.

MR. ANDERSON: I think, your Honor, that would be the shortest way because there might be a lot of discussion on it. I therefore offer in evidence draft of contract dated April (blank), 1919, signed by the General Chemical Company, by W. H. Nichols, President, and the Secretary, with the seal of the Chemical Company attached, but not signed by the United States of America. I ask that it be read as Plaintiff's Exhibit No. 655.

Received in evidence and marked "Plaintiff's Exhibit No. 655." (*See Exhibits, Vol. III, page 1625.*)

MR. KRESEL: As long as the Government insists on putting that instrument into the record, I think it is proper and fair that the Government should produce the correspondence between it and the Chemical Company showing the Government's side of this and why the Government declined to enter into this agreement.

MR. ANDERSON: I will be very glad to produce the entire correspondence. All the correspondence that I have on the subject is a letter from General Nichols addressed to Mr. Arthur S. Glasgow—it should be Arthur G. Glasgow—United States Fixed Nitrogen Administrator, dated April 23, 1919, which I shall be very glad to offer with the contract, and I will be very glad, if counsel desires it, to produce any correspondence dealing with this contract or proposal that we can find in the files of the War Department.

MR. KRESEL: Apparently you were able to

find one letter. There are other letters, are there not?

MR. ANDERSON: I can not answer that.

MR. KRESEL: Because this one letter that you now produce is a letter from the General Chemical Company.

MR. ANDERSON: I can not answer the question.

MR. KRESEL: There must be letters from the Government to the General Chemical Company. Now, let us have those.

MR. ANDERSON: Your Honor, I have done all I can do when I say I will produce any correspondence bearing on this subject. I can not say there is any because I have not seen it; and when I say I will produce it, I will produce it. There is no use discussing that matter further.

THE COURT: What is there for me to rule on?

MR. ANDERSON: Not a thing that I know of, sir.

MR. HERSHKOPF: We have an objection to this on the ground that it is *res inter alios acta*, represents an offer not accepted, and is therefore irrelevant.

MR. KRESEL: That objection has been made.

MR. ANDERSON: I will ask leave to attach, as the correspondence has been called for, as part of the same exhibit, the letter of General Nichols transmitting this paper.

MR. KRESEL: We object to it, not only upon the grounds we have already urged but on the ground it is a self-serving declaration and, standing alone, ought not to be admitted any way.

MR. ANDERSON: It is the letter of General Nichols himself.

MR. KRESEL: I know, but if the correspond-

ence is to go in the entire correspondence should go in.

THE COURT: You are going to produce the remainder, if there is any. Why not keep this until it is all together, so it will not be separated.

MR. ANDERSON: Merely that it is a letter transmitting this paper to the War Department, sir. It is a letter of transmittal that is all.

THE COURT: Admitted.

MR. ANDERSON: And I will produce any other papers I can find on the subject.

Received in evidence and marked "Plaintiff's Exhibit No. 655-A." (*See Exhibits, Vol. III, page 1632.*)

THE COURT: You understand that I am expressing no opinion about the admissibility of this.

MR. ANDERSON: I quite understand, sir; it is admitted under the general rule.

XQ. 322. I go on to page 1132 of the same hearings before the Committee on Military Affairs, on Muscle Shoals, Doctor, in which there was discussion of the price of ammonia and ammonia gas, where Mr. Parker, of the Committee, asked some questions:

"MR. PARKER: And is this product manufactured there cheap enough to sell on the market for that purpose?"

MR. KRESEL: What is "there?"

MR. ANDERSON: "There," I take it, is referring to the plant down in Alabama. I would have to go back very far to connect that, because of the discussion of both plants, and what I am getting at I do not think makes that material.

MR. KRESEL: You see, my paging is different; therefore, I can not follow you. I am sorry.

XQ. 322. (continued)

"DOCTOR PARSONS: But it first has to be liquefied.

"MR. PARKER: And is this product manufactured there cheap enough to sell on the market for that purpose?

"DOCTOR PARSONS: No, sir; because it has to go into competition, with other ammonia which is on the market much more cheaply than it can be produced at that plant.

"MR. PARKER: Why is the other much cheaper?

"DOCTOR PARSONS: Simply because at the present time the supply is in excess of the demand, I presume.

"MR. PARKER: When the demand is reasonable for this product, can they make it as cheap as it can be made by other processes?

"DOCTOR PARSONS: They can not. They can make it much cheaper by the Haber process than they can by the cyanamid process, no matter what the demand may be.

"MR. PARKER: You had something to do with putting in plant No. 1, did you not?

"DOCTOR PARSONS: I did not.

"MR. PARKER: I misunderstood you.

"DOCTOR PARSONS: I had something to do with the board that advised its being put in. It was put in by Government engineers.

"MR. PARKER: You afterwards did work with the Syracuse company?

"DOCTOR PARSONS: Afterwards I was consulting chemist with the Syracuse company until last August, when their plant began operating.

"MR. PARKER: Do you know why the process failed at plant No. 1.

"DOCTOR PARSONS: I do not consider that the process failed at No. 1, but why it did not operate successfully in the first place was due to a number of causes. The first and most important was that the catalyst which at that time they expected to use could not be made on a large scale successfully, as they were able to make it on a small scale in the laboratory.

"MR. PARKER: Can they do it now?

"DOCTOR PARSONS: They do it now, but they use another catalyst.

"MR. PARKER: Is that a secret catalyst?

"DOCTOR PARSONS: It is.

"MR. MCKENZIE: Pardon me, Mr. Parker, will you permit Doctor Parsons to explain that term?

"MR. PARKER: Catalyst?"

Yes, you have already explained the catalyst, so I will omit that part, if there is no objection. Then going on discussing it further, after you have explained what a catalyst is:

"MR. PARKER: They make such a pure sulphuric acid that they could carry around in an iron receptacle.

"DOCTOR PARSONS: Yes; and another thing, if there happens to be any arsenic in that sulphuric acid, the platinum will not work. It poisons the platinum the same as it would poison a human being.

"MR. PARKER: The Agricultural Department people said they had a first rate catalyst now.

"DOCTOR PARSONS: Yes; they have an excellent catalyst, the best in the world.

"MR. PARKER: But you said the catalyst was a secret.

"DR. PARSONS: The catalyst which the General Chemical Co. uses is a secret.

"MR. PARKER: And is the one that the Agricultural people use just as good?

"DOCTOR PARSONS: In my opinion it is better.

"MR. PARKER: Then there is no difficulty about the catalyst in carrying on this manufacture by the Haber process.

"DOCTOR PARSONS: That is quite correct.

"MR. PARKER: Now, what other difficulties besides the catalyst which they had there were there about that process? I heard something about leakages, etc.

"DOCTOR PARSONS: That was the second great

difficulty. Of course, it was one of the first experiences that the mechanical engineers of this country had had with pressures of 1,500 pounds per square inch in large units, and there were certain leakages and certain bulges in the apparatus which they had difficulty to fix. They have overcome that absolutely at the present time, and since those early days also the Chemical Foundation has taken over the German patents.

"MR. PARKER: Who overcame those leakages? Do you mean that the Ordnance people down at Muscle Shoals have overcome those leakages?

"DOCTOR PARSONS: A number of those leakages were overcome and were being overcome before the plant closed; but they have been more especially overcome in the redesigned plant at Syracuse.

"MR. PARKER: Would you then advise, and would it be necessary, to redesign plant No. 1 to make it worthy?

"DOCTOR PARSONS: Yes, sir; I think it would."

Then you go into the cost. (Continuing reading.)

"MR. PARKER (interposing). Were all those things separate?

"DOCTOR PARSONS: All those things are separate entities, but the steam plant is essential to the Haber process if you are going to use the method which is used at Syracuse.

"MR. PARKER: You have to have a steam plant and then what do you get to mix with it—do you get hydrogen in the same way; what is the process, by the way?

"DOCTOR PARSONS: In the Haber process as operated in Germany and as operated at Syracuse and as was contemplated in the operation of plant No. 1 at Muscle Shoals, the hydrogen is obtained by the action of steam on red-hot coal or coke. It is impossible for me to explain this without using chemical terms, although I will try to do it."

MR. KRESEL: You have not asked him whether he so testified.

XQ. 322. (Continued) You did so testify, did you not?

A. I did.

XQ. 322-a. On page 1134 of the same volume, after you had explained the monoxide and the results in the production of hydrogen, and the taking out of carbon dioxide by washing it under 30 atmospheres pressure, etc., Mr. Parker asked:

"MR. PARKER: Is there any expensive chemical required to take it out?

"DOCTOR PARSONS: You have to use some caustic soda to get out the last part of it.

"MR. PARKER: All this is a pretty cheap process of making hydrogen, is it not?

"DOCTOR PARSONS: It is about as cheap as any process used extensively to make hydrogen in the world to-day. I think there are possibilities of other cheaper processes. In fact, the basic feature of the Haber process lies in getting cheap hydrogen. I understand in plant No. 1, so far as the cost of operation is concerned, 20 per cent of the cost was in the production of hydrogen and 50 per cent in its purification.

"MR. PARKER: That can be done cheaper than that, can it not?

"DOCTOR PARSONS: It is being done cheaper than that now by the improvements that have been made.

"MR. PARKER: Are the plans in connection with plant No. 1, for production and purification, all right?

"DOCTOR PARSONS: They will have to be changed.

"MR. PARKER: Which part?

"DOCTOR PARSONS: The whole of it.

"MR. PARKER: The whole machinery?

"DOCTOR PARSONS: Not the whole machinery, but there will have to be very extensive changes made in plant No. 1.

"MR. PARKER: What will that cost?

"Doctor Parsons: That comes in the cost I have given you."

Mr. Kresel: You did not read his costs, you omitted all that.

Mr. Anderson: I will state without reading it, that the estimate given by the witness was that the plant could be put into operating form to produce 30 tons a day at a cost from $1,500,000 to $2,000,000.

XQ. 322a. (Continued) "Mr. Parker. Having gotten your hydrogen, what is next?

"Doctor Parsons: They run the nitrogen in from the air at the same time that they make the original water gas. They get the nitrogen in that way. But in my opinion, it is not the best way of working. The proper way to work it, in my opinion, is to get the nitrogen from the Claude or Linde liquor-air plants."

It should be "liquid air," but it is "liquor-air" here.

"Mr. Parker: I thought the liquid air was a very expensive proposition.

"Doctor Parsons: Nitrogen by the Claude process would be produced for about 10 cents per thousand cubic feet, which makes it a very small proportion of the total cost.

"Mr. Parker: Is it expensive to make the two unite?

"Doctor Parsons: Not particularly.

"Mr. Parker: Is that where the catalyst comes in?

"Doctor Parsons: That is where the special catalyst comes in.

"Mr. Parker: Of course, you were employed by the Syracuse company, and you can not tell what their catalyst was?

"Doctor Parsons: I do not know; they kept it secret from me.

"Mr. Parker: Then how do you know that the other is better?

"Doctor Parsons: I have seen the results of

the comparative tests made in the nitrogen fixation laboratory.

"MR. PARKER: That is only a laboratory experiment?

"DOCTOR PARSONS: No. They have there a pretty big plant themselves.

"MR. PARKER: You are sure that the catalyst that they have developed in the Agricultural Department laboratory is the best in the world, and they say they think it is.

"DOCTOR PARSONS: That is my opinion also.

"MR. PARKER: That gives you the ammonia?

"DOCTOR PARSONS: That gives the ammonia; yes, sir.

"MR. PARKER: What is next in the Haber process?

"DOCTOR PARSONS: That completes the Haber process."

THE COURT: Is that about all of that, Colonel Anderson?

MR. ANDERSON: No, sir, there is a good deal more. I am sorry to have to burden your Honor with this, but in view of the testimony on the direct, I feel that I must.

THE COURT: That is all right. I was just wondering whether over night you could not mark it and have it all identified by the witness over night, agree that he so testified, and let it go in.

MR. ANDERSON: Before closing the evidence on that point, I would like to ask a question.

XQ. 323. I would like to ask you if you so testified as I read from page 1134?

A. I did.

MR. ANDERSON: I will endeavor to see what I can do on that, sir. It is taken from the record here and there.

THE COURT: That is only a suggestion because it is pretty difficult for me to carry all facts

disclosed in reading, and I assume you will put in your briefs those portions which you think are in conflict with the direct examination. I rather assume that will be more helpful to me than this. In one case I had a brief which amounted to a good many hundred pages—that is, probably ten or fifteen hundred. Then there was a summary of that brief which was probably fifty pages in length.

It seems rather absurd when you speak of it that way, but I found it highly practical, because there were cross references and then if I lost my way in the vastness of the larger briefs, I could get straightened out immediately by turning to the smaller briefs; then when I wanted to elaborate it I could go back to the larger briefs. I do not know how it seems from counsel's standpoint, but from my standpoint it was very helpful.

Mr. Anderson: I think the indication of your Honor's thought about that is excellent. We have already been discussing the question how we could possibly summarize this evidence in such a manner that your Honor could examine it within a reasonable time, and we will use, and will ask the liberty together with counsel on the other side of consulting your Honor's experience in any suggestions along that line.

The Court: For a large mass of testimony I have found that the most workable and practical way that has come under my observation.

Mr. Anderson: I will suspend with this, if it is your Honor's wish.

The Court: I am not sure that I am getting very much from that reading and I think we might save time by doing as suggested.

Mr. Kressel: Your Honor, may I direct your

attention to the fact that this case is well into the sixth week. Of course, counsel on both sides are doing everything possible, I realize, to cut it short. I have been looking through my list of witnesses and I find that I still have eight witnesses to call.

I would suggest, if it is not imposing too great a burden upon your Honor, that the hours of our session here be lengthened so that we may get away a little sooner. I know your Honor has always said that you would do and you have done whatever counsel requested in the matter. I realize it is a strain on everybody, but I think it would be better in the long run if we lengthened our session a little so as to try and get through this week.

Your Honor will recall you asked me one day last week how soon I thought we would be through.

I said I thought we would be through with our case by Tuesday, or Wednesday at the latest. As I see it now, the cross-examination is going to be somewhat extensive, judged from the cross-examination of this witness. I could not possibly get through by Tuesday, nor by Wednesday if we are going on at this rate. So I am making the suggestion with all deference to your Honor and to Colonel Anderson that we meet a little earlier, if possible, and sit later, so that we can get through this week.

MR. ANDERSON: Does your Honor wish any expression from me on this subject?

THE COURT: No. Before Mr. Kresel made his remarks I was going to and was in the act of asking him what he had to say about the time this case would end, and I wondered whether the time had been underestimated. Really, since the adjournment on Saturday I have been thinking if

this case runs over this week of the advisability of letting a Master or Commissioner or Examiner take all testimony after this week, because there are certain other cases that do demand my attention.

MR. KRESEL: I know your Honor has been very patient with us, and very good about it; but I think if we sit an hour longer a day there is a chance that we may get through this week.

THE COURT: I am perfectly willing to convene Court at any time in the morning that you suggest —half an hour earlier or an hour earlier.

MR. KRESEL: I think half an hour earlier, your Honor, and if you sit half an hour later it will give us an additional hour a day.

MR. ANDERSON: If your Honor please, I would very seriously object to being in Court a half an hour earlier in the morning. Your Honor will understand that this phase of the case that is now being presented to the Court was not directly indicated in the Answer. Therefore, it could not be anticipated in quite the form it has taken. Therefore, I must have a certain amount of time to meet it.

THE COURT: Your objection to the earlier session is answered immediately. We will not sit earlier.

MR. ANDERSON: I am willing to sit later in the afternoon, although the strain on me in preparing for cross-examination, not knowing what the witness is going to testify to, is a great deal heavier, and I have been working in the night ever since I have been here. I simply could not get here earlier in the morning without great inconvenience.

THE COURT: We will not ask you to, then, but

if this case continues after this week I may refer it to somebody to take the testimony. There are certain cases which must be disposed of, and I find it is impossible—I have tried it—to do effective work on them in the time allowed.

MR. ANDERSON: I think it is due to your Honor to say that this case will not be finished this week now.

MR. KRESEL: You say there is no possibility?

MR. ANDERSON: No, sir; I do not think counsel for the defense will finish this week. He has eight more witnesses bearing on these questions, and certainly there will be a considerable amount of rebuttal upon the branch of the case upon which we are now engaged.

THE COURT: Then can you proceed with other matters into which you were going, and save time over night by getting together all the portions of the witnesses's testimony that you want to ques- him about.

MR. ANDERSON: I will do my best, your Honor, sir.

THE COURT: All right.

MR. KRESEL: I did not understand we were going to adjourn now.

MR. ANDERSON: Oh, did I misunderstand?

THE COURT: I thought you said you were going ahead with other matters. Did I misunderstand you?

MR. ANDERSON: I did misunderstand, your Honor; I thought your Honor was going to adjourn.

THE COURT: Is it convenient for you to continue your examination now in such manner as you see fit? It seemed to me we could save time if you could get this former testimony together during the night and ask him about it.

MR. ANDERSON: I think then, sir, my plan of cross-examination is entirely outlined on presenting this evidence and then basing further cross-examination on that. It is now a quarter past three. If your Honor adjourns this afternoon, with your Honor's understanding that we sit an hour later from this time on during the week, I would prefer to stop now and finish with the examination tomorrow.

THE COURT: And Saturday?

MR. KRESEL: Yes, your Honor, if you are willing we will sit all day Saturday.

THE COURT: All right, a full day Saturday, and our regular sessions will begin at 8.30 Standard Time, to 11:45 Standard Time, and from 1 to 4 Standard.

I will adjourn Court.

(Whereupon at 3:20 o'clock P. M. Standard Time, adjournment was taken until Tuesday, July 17th, 1923, at 8:30 o'clock A. M. Standard Time.)

TWENTY-NINTH DAY.

Wilmington, Delaware,
July 17th, 1923, at 8:30 o'clock, A. M.
Standard Time.

Before:

HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

THE COURT: May I make this observation: The case has already continued many days beyond its allot-

ted time. So far no restrictions have been placed by the Court upon counsel; but the case must now be expedited and brought to a close. The afternoon session today will be from one to four-thirty o'clock, Standard Time. If substantial progress be not made during the day, evening sessions will be held.

So far as Dr. Volwiler's cross-examination is concerned, that will be in chambers in any event, and I will take that in the evening. You may arrange with counsel on the other side as to when that will be convenient; but that will be taken in the evening so as not to interrupt the day session.

CHARLES L. PARSONS resumed the stand.

MR. ANDERSON: May it please the Court, on yesterday morning, your Honor will recall that I made a combined motion to strike out an objection, and asked that it be applied to all questions and answers preceding and subsequently, relating to the question of validity of these patents. There was no ruling on the motion and objection, and of course, no exception noted on the record. But as I understand we are proceeding, it is merely to give notice to the Court of those points which will be raised finally, and therefore it is not necessary to renew them or ask for a ruling.

THE COURT: I have no objection to stating that I fail to see the validity of the objection raised, so far as the Chemical Foundation being an assignee is concerned I fail to see the validity of the objection so far as the United States, being a licensee is concerned; nor do I see anything to prevent the Chemical Foundation from setting up all difficulties that may arise in connection with the patent which would reduce their

monetary value, particularly if at all short of complete invalidity. I speak of the act of assignment from the Government to the defendant because I can not see that that would estop the defendant from asserting invalidity any more than it would if you had, for instance, reports from the Government, and would be entitled to assert under certain conditions that they were comparatively worthless. You deny, as I understand your contention, that the Government has taken a license from The Chemical Foundation. So I assume that so long as you stand in that position you would not be in a position to assert the estoppel. However, you may consider that no definite ruling has been made, and we will proceed upon the General Rule, stating your objections as we go along.

MR. ANDERSON: With the right to raise the objections; that is what I wanted to make clear. There was one other formal point that I wanted to make clear. In examining the record last night, I found there were over thirty pages of matter which was read from exhibits in evidence, and which is, of course, a duplication of the record.

I would like to ask, even if the Court feels it can not direct that to be stricken from the record, that instructions be given that on the printing of the record that need not be printed, under the Equity Rule prohibiting duplication.

THE COURT: If you will point that out; but I can not ask the Clerk to do that.

MR. ANDERSON: I would be very glad to point it out, sir.

THE COURT: And let me say here, Colonel Anderson, that that is not criticism on the part of the Stenographers, or any of them, in taking that down, because I would find great difficulty, as they

do, in knowing just exactly when to begin to write and when to stop writing as a result of the way matters are being put in; and that is not criticism of counsel.

MR. ANDERSON: I am not criticizing. I am merely trying to avoid duplication in this record. I would be glad to point it out either now or later. I do not want to take up the time just now.

THE COURT: Not now.

MR. ANDERSON: In order to shorten the examination, in accordance with the discussion of yesterday, I have made up a list of references to former hearings, as to which I wish to ask the witness by pages, indicating the beginning and ending of the question. I thought I had a copy; but I must have left it. I would be very glad to hand it to counsel and check those beginnings and endings, and ask Dr. Parsons if he so testified in each of those cases, and avoid the reading of them; just have the stenographer copy them into the record.

MR. KRESEL: You can take it for granted, Colonel, that Dr. Parsons will say, of course, that the testimony as reported, was given by him. Now, our stipulation goes to that effect, even without his saying it; so there is no necessity of spending time on that.

MR. ANDERSON: Then, we agree that these extracts may go into the record as questions, with the understanding that Dr. Parsons' answer would be that he so testified. That will save the time of going over it entirely, and I will hand this to the stenographer, and if he needs any assistance he will let me know, and we will get him to put it in the record accordingly.

THE COURT: You are satisfied with that arrangement, Dr. Parsons?

THE WITNESS: Yes, sir.

MR. ANDERSON: I would ask that the Court need not here direct to have this copied in, and I will hand the stenographer this memorandum which I will explain to him later with the co-operation of counsel. That is the memorandum of Dr. Parsons's questions.

MEMORANDUM OF DR. PARSONS' TESTIMONY BEFORE THE COMMITTEES NAMED BELOW TO BE READ INTO THE RECORD.

1. Muscle Shoals Hearing. P. 1135.

"MR. PARKER: That process does not need much power, but needs a great deal of steam and coal, does it not?

"DOCTOR PARSONS: That is correct; the Haber process requires only one-tenth of the power of the cyanamid process, and about one-fiftieth of the power of the arc process used in Norway. The Norwegians could profitably turn their plants into plants to use the Haber process, and I think they would use it if it were not for the complications in connection with the German patents.

"MR. PARKER: If you were to use Plant No. 1 for the manufacture of fertilizer I suppose you would take the ammonia and pass it through sulphuric acid to make the sulphate?

"DOCTOR PARSONS: That would be the normal procedure at the present time.

"MR. PARKER: And the cheapest way to get sulphate of ammonia; but personally I am inclined to believe that we are going to develop other methods, and I should not be at all surprised if this double sulphate and nitrate of ammonia, which is credited with having exploded in Germany, is what will ultimately be used.

"MR. PARKER: You would use that, although they had that tremendous explosion at the plant in Germany.

"DR. PARSONS: I do not think the explosion was due to the composition of the material; I think it was due to some other cause.

"MR. PARKER: I beg your pardon by asking you so many scientific questions, but I thought that was the only way to get the information, both for myself and other members of the committee.

"DR. PARSONS: I am very glad indeed to have your help. I think it will interest you to know something of the action of the catalyst in the oxidation of ammonia. If you take a mixture of ammonia and air and blow it through a layer of platinum gauze which is heated to a red heat, your ammonia and oxygen will combine entirely differently from any other combination which they can be made to make under other conditions. If you put iron gauze there or copper gauze or silver gauze the action does not take place, but if you use the platinum, you can blow it through almost as fast as you can blow it, and practically all of the ammonia will be converted into nitric oxide, which absorbed in water makes nitric acid. We do not know what does it, but we do know that that is the action that takes place. There are many incidents of the kind in connection with chemical products."

Page 1136:

"MR. PARKER: The platinum is used to a certain extent for a catalyst, and it is so hard to get at present that I wanted to ask whether this catalyst which is used by the Department of Agriculture, depended upon platinum for its composition?

"DR. PARSONS: It does not.

"MR. PARKER: Does it depend upon any rare metals that are hard to get?

"DR. PARSONS: I think it does not depend on rare metals only. It is generally known that most of the catalysts, the German catalyst, and I think the General Chemical Co.'s catalyst, and this one at the nitrogen fixation laboratory, are largely iron, and it does——

"MR. PARKER (interposing): Does it waste very fast?

"DR. PARSONS: No; this is a very substantial catalyst that they have here.

"MR. PARKER: Then as a general conclusion you think, with the aid of the Department of Agri-

culture, the No. 1 plant, with an expenditure of a million and a half dollars, can be turned into a productive plant for ammonia at reasonable rates.

"DR. PARSONS: I think it can; yes."

Page 1136:

"MR. QUIN: I would like to refresh your memory on that. I was here at that time; I have been on this committee ever since 1913, and in 1916 we got a bill through providing for the establishment of nitrate plants, and Mr. Washburn's testimony had a good deal to do with it. The cyanamid process was the one that they thought was going to be adopted. Congress declared war at the President's suggestion on the 6th day of April, 1917, and as I understood it, and the Congress understood it, we were in danger of not having sufficient nitrogen from the Chilean source. We did not know whether we would be cut off from that or not, and you claim now that an emergency did not exist. Well, these gentlemen went abroad and built Plant No. 1, but it was constructed in such a way that it did not succeed. That is true, is it not?

"DR. PARSONS: Its first trial was not thoroughly successful.

"MR. QUIN: They testified before this committee that that plant was a failure.

"DR. PARSONS: I disagree with them. At its first trial it did not function any more than the Haber plant functioned in Germany in its first trial, and they had to go over it and try it out two or three times and rebuild it before it finally operated fully and successfully.

"MR. QUIN: They abandoned, did they not?

"DR. PARSONS: No; it was carried on and made a perfect success at Syracuse.

"MR. QUIN: You mean a different plant was erected. There was a difference between the plant at Syracuse and the No. 1 Plant at Muscle Shoals?

"DR. PARSONS: The process is essentially the same, but they have changed the mechanical construction, and they have changed the catalyst, as I have already testified.

"MR. QUIN: Why did they not change that and make the process at Muscle Shoals a success?

"DR. PARSONS: Because they had no time before the Armistice. They found that the mechanical construction at Muscle Shoals was not right and that the catalyst which they used was inefficient and could not be made in large quantities."

Page 1137:

"MR. QUIN: Some gentlemen testified that by making certain changes in the process that caused the thing to be a failure there. Some of these experts testified that way.

"DR. PARSONS: That by making changes in the General Chemical Co.'s process it ceased to be a failure?

"MR. QUIN: They spoke about the fact that they changed some of the processes in the construction of this plant at Muscle Shoals.

"DR. PARSONS: My understanding is that the plant was built down there the best that they were able to build it after consultation between the General Chemical Co.'s engineers and the engineers of the Government, and that the Government engineers insisted on certain changes in the plant construction which the General Chemical Co.'s engineers did not thoroughly agree to; and as a result, anyway, both of them felt that the other was more or less to blame for the failure of its early operation. But as a result of the experiences which they gained there a new factory has been built which is functioning completely, and functioned well from the first day it turned over its wheels.

"MR. QUIN: Then the one they constructed with Government funds at Muscle Shoals did not turn out the stuff, and the one they erected for themselves did turn it out, and you say they produced several more tons per day than they anticipated?

"DR. PARSONS: The one they erected at

Muscle Shoals did not do it, but if they had gone on and made the necessary changes and installed the apparatus which they now have installed at Syracuse it would have functioned; that has been proven by the actual fact that the Syracuse plant is functioning perfectly at the present time."

Page 1137:

"MR. QUIN: They have testified before this committee that there are new processes now which are liable to knock out both of these processes and produce the nitrogenous products at about one-half of what they are costing now, do you know about that?

"DR. PARSONS: I think I know all the processes for nitrogen fixation which are at all economical and which are being used in the world, and I do not know to what you refer.

"MR. QUIN: They did not tell us what they are.

"DR. PARSONS: They are referring unquestionably to the improvements in the Haber process, because they are the only ones actually doing it today.

"MR. QUIN: Did you read the report of the British Nitrogen Products Commission, appointed for the purpose of looking into the fixation of nitrogen?

"DR. PARSONS: I did, and I read it with care.

"MR. QUIN: In that report, of 1920, that commission, consisting of eminent scientists, doctors of chemistry and kindred subjects, stated several things, and wound up by saying that 'the commission recommends that this cyanamid process should be established in Great Britain without delay either by private enterprise, supported, if necessary, by the government, or as a public work.' What do you say about that record of the British commission?

"DR. PARSONS: I say that the report of the British commission was made during wartime. I was in consultation with the most of the members of that committee frequently during the war. I

saw them on the other side, and I saw Dr. Harker on this side. I know most of the important men on the commission personally, and some of them intimately.

"MR. QUIN: That was in 1920?

"DR. PARSONS: That is when it was issued, not when it was made. They believed in England that they should put in both processes, so that they would know the operation of each. They also in that report made a recommendation not only for the Haber process, but they spoke in much higher terms for the Haber process than the cyanamid process, and the Haber process is being put in in England today, and the cyanamid process has been completely abandoned and will never be put in England or in any other country, in my opinion."

Page 1140:

"MR. FISHER: Are you not aware of the fact that the Secretary of War, through the Chief of Engineers, communicated with every concern in the United States which he thought was interested in the development of Muscle Shoals?

"DR. PARSONS: As I read it, he asked them what they thought should be done with it, and whether they had any suggestions to make, and one or two of them did make suggestions. It has never been formulated as to what you had to sell, and nobody knows today what you had to sell down there, and the minute it is known what you have to sell I think you will get offers for it. I think if Plant No. 1 was put up for sale, with a certain amount of power to go with it, I could myself obtain associates and make a nitrogen industry down there along modern lines, the same as they are doing in Germany, the same as they have started to do in Norway, the same as they are doing in England, and just as they are planning to do in France, and in Italy, and as they have started to do at Syracuse, which will fix nitrogen and make nitrogen fertilizer much cheaper than you will ever get it by any possible use of the cyanamid process. I think it can be done successfully."

Page 1143:

"Mr. Wright: Is it not a fact that they do not ever agree—and I am not saying anything to their discredit—but on a proposition like this, for instance, you say that the cyanamid process is obsolete, and that the Haber process is the correct process; while a man, who is just as eminent as you, would follow you on the stand and he would swear that the Haber process was impracticable and the cyanamid process was the only one that was feasible.

"Dr. Parsons: I would like to find one in America that will say that at the present time—who is still sane.

"Mr. Wright: I do not think you will ever get two of them that will agree.

"Mr. Miller: I see in the British Nitrate Commission's report that they speak very highly of the arc process or the electric process. That makes nitric acid, does it?

"Dr. Parsons: Yes; that is one of the basic reasons why it is not used in this country; and also it is very wasteful of power. It uses five times as much power as the cyanamid process, and it uses approximately 50 times as much power as the Haber process. If it was not for the Haber patents—and I think, I have a basis for this statement (it can not be used in Norway, although it can be used in the United States)—I think the arc process in Norway would be changed into the Haber process in a year, because they could use their water power and make their hydrogen electrolytically, and they could turn out five times the amount of nitrogen, in ammonium salts instead of nitrates, that they can today, and do it cheaper."

2. Hearing on Sundry Civil Appropriation Bill, 1922. Testimony of Dr. Parsons. Page 190. Haber Process.

"Dr. Parsons: Yes, sir. I now come to the Haber process. In the Haber process pure nitrogen and pure hydrogen, two gases, are brought together under pressure and increased temperature in the presence of a material which is known as

catalyst—such a material which by its presence hastens the reaction of nitrogen and hydrogen combining directly to form ammonia. This is the same gas which you get from cyanamide, and of which I have spoken. The Haber process is not as simple as the few words which I have used would indicate. There are many problems connected with the production of pure hydrogen, but the problems are being steadily solved. They have been commercially solved in Germany. The Haber process there, where they know the most about it, has made a wonderful success. They have a plant there with a capacity of 300,000 tons of combined nitrogen per year, equivalent to some 1,200,000 tons of ammonium sulphate. There is one plant of about 90,000 tons erected at Oppau, near Ludwigshafen, on the Rhine, which was the first plant built. Afterwards, they built another plant a little more than twice the size of the plant at Oppau, which is at Merseberg, near Halle, in Germany, some 200 miles from the other, and away from the scene of war activities. These plants have been working so successfully that the German Government within the last two or three months authorized the exportation of 85,000 tons of ammonium sulphate from those plants, although it was claimed that they wanted to keep all their nitrogen in Germany in order to increase their food production.

"The production of pure and combined nitrogen gas required for the Haber process is a very simple matter, simply taking it out of the air. There is no difficulty about it whatever; in fact, it can be made very simply in connection with making the hydrogen, and two-thirds of it is so made without any additional cost at the plants in Germany, the rest of it being made by liquid-air machines. A plant working under heavy pressures, as in Germany, where they use 200 atmospheric pressures, requires very great mechanical skill. This process, however, increased from a capacity of 6,000 or 8,000 tons of nitrogen in 1914, to about 300,000 tons at the close of the war. They have

an output in Germany in excess of all the rest of the processes put together. The Claude process in France, peculiar as it may seem, works under 1,000 atmospheric pressure, 10 times the pressure of the Haber process, but by that very fact they have overcome many difficulties and the mechanical difficulties have been solved. It takes very little metal compared to the Haber process, because the gases occupy so much less space, and therefore since the machines have very much smaller diameter, their capacity to resist pressure is greatly increased.

"THE CHAIRMAN: Why is it that the Haber process which was installed at Sheffield is not a success, if it is based on the true principle for producing nitrogen?

"DR. PARSONS: That is a very hard question to answer, Mr. Chairman. There is a certain amount of controversy which I doubt will ever be settled. It was put in as an experimental plant advisedly and was adopted with that understanding originally by the Board that had charge of the matter. Being built for the first time, they had to go through the same kind of experiences that they had to go through in Germany. It was five or six years before they had any success at all in Germany. I have not the slightest doubt whatever that with the modifications that Dr. Tolman and others are now working on, in research lines, that the plant will ultimately operate. I expect to see it operate and to operate very much more successfully than the other, Plant No. 2. This plant requires little power. The Haber process differs from the others in that the power is not a basic consideration. It requires larger quantities of steam. As hydrogen is all made from steam—very large quantities of steam are required. That is why they have so large a steam plant in connection with this plant at Muscle Shoals, Plant No. 1, not the big power plant, but the plant in connection with Plant No. 1 which is over at Sheffield; that is chiefly to make the steam which is necessary. The Haber process requires about 0.2 to

0.3 of a horse power per ton of nitrogen per year. The cyanamid process requires about 2.5 to 2.7 horsepower per ton of nitrogen per year, and the arc process requires about 10.5 horsepower per ton of nitrogen per year.

"THE CHAIRMAN: Stating that in dollars per ton, what does it mean?

"DR. PARSONS: On the power basis?

"THE CHAIRMAN: Yes, sir.

"DR. PARSONS: It would mean that the power required for the arc process is about five times that required for the cyanamid process and nearly 30 times that required by the Haber process. Of course that might vary somewhat.

"There is one other statement which I started to make, which I failed to finish, in reference to cyanamid. I want to tell you why the cyanamid process has been continued in Germany and some of these other countries since the war, along with the Haber process, although in much less quantity. The continuation is due to the fact that the cyanamid process requires only about one-half of the coal that the Haber process requires. The cyanamid process requires from 3 to 3.5 tons of coal and the Haber process from 5.5 to 6.5 tons of coal per ton of nitrogen fixed—I am giving you approximations—nearly twice as much. In Europe during the last few years coal has been the rarest material they have and they could afford to run the cyanamid process alongside of the Haber process on account of the great cost of coal. Now that the price of coal is coming down conditions are changing. According to information that I have, the cyanamide process this year will probably supply only about 1.6 of the nitrogen which was produced by it last year in Germany.

"THE CHAIRMAN: If I recall correctly the statement of the Secretary of War, when he appeared before the sundry civil subcommittee, it was to the effect that the Haber process plant at Sheffield was not an exact duplicate of the plant constructed in Germany, but there were some modifications?

"DR. PARSONS: It not only is not a duplicate, but it has, except in general principles, very few similarities. It is run at less than one-half of the pressure, and they used a different catalyst, which is the basis of the process. They had many things to work out.

"THE CHAIRMAN: Have we in this country a suitable catalyst for use in the Haber process?

"DR. PARSONS: I think there is no question that we have in this country as good a catalyst as they have in Germany. I think Mr. Tolman believes he has a better one, and I presume he may have, at least I hope so.

"THE CHAIRMAN: Just where are the economies in the production of nitrogen by the Haber process that are not found in the cyanamid process?

"DR. PARSONS: Well, there is a great difference in power. There is a great difference in labor, and there is a very great difference in the cost of materials, so that it is very difficult to compare them, because they are so entirely different; and it is a question that it is difficult to answer in detail. It is thoroughly well understood on the other side, as I think can be shown by the reports of their commissions and the way the other countries are going into it, that there is no question whatever that the Haber process is considered the process of the future. I do not think anybody denies it except the people who are interested in cyanamid plants.

"THE CHAIRMAN: Does it take more labor to produce a ton of nitrogen by the cyanamid process than by the Haber process? You have already said it takes more power.

"DR. PARSONS: And more laborers in the plant.

"THE CHAIRMAN: How about the construction of the plant itself?

"DR. PARSONS: Of course, I mean that portion of the plant which has to do with the production of the ammonia. At the plant in Germany there were large numbers of laborers, but that plant made not only ammonia and ammonium

sulphate, but made many other things at the same time.

"THE CHAIRMAN: You have stated that you were associated with the Secretaries of War, Commerce and Agriculture?

"DR. PARSONS: I stated that I accompanied them, but did not say I was associated with them.

"THE CHAIRMAN: I mean, you were in consultation with them?

"DR. PARSONS: Oh, yes.

"THE CHAIRMAN: You were at that time the chief chemist of the Bureau of Mines?

"DR. PARSONS: Yes, sir."

Page 196, "Royalties."

"THE CHAIRMAN: But the plant itself can not be used except to manufacture cyanamid by the cyanamid process, and that process is a patented process.

"DR. PARSONS: Yes, sir.

"THE CHAIRMAN: The patents being owned by the American Cyanamid Co.

"DR. PARSONS: The American patents being owned by the American Cyanamid Co.; yes.

"MR. MAGEE: What about the Haber process? Are there patents in connection with that process?

"DR. PARSONS: The American patents of the Haber process belong to The Chemical Foundation in New York City and are available to anyone in this country on equal terms with anyone else.

"MR. MAGEE: What I mean is this: As far as the patents are concerned, what would be the difference in cost?

"DR. PARSONS: So far as the Haber process is concerned, the cost for the patents is nominal, because that has already been passed on. They have sold their rights to the Haber process to this American Nitrogen Corporation, and any other American corporation can obtain those patent rights at exactly the same figure.

"MR. BYRNS: By buying them.

"DR. PARSONS: By paying the royalty; that is, they have the non-exclusive right to use such of the Haber patents as they need, if any, but must

pay a royalty, although the royalty, as I understand, is really nominal.

"MR. BYRNS: Do you know that personally?

"DR. PARSONS: Yes.

"MR. MAGEE: I would like to know the difference in the royalty cost under the cyanamid process and under the Haber process.

"DR. PARSONS: Well, I do not know what the figures are.

"MR. MAGEE: Well, approximately.

"DR. PARSONS: I have no idea whatever. I was simply told that the intent of The Chemical Foundation was to put those patents at the use of all American manufacturers at a rate which would be a reasonable one.

MR. MAGEE: So that the cost would be nominal?

"DR. PARSONS: Yes, sir.

"MR. MAGEE: Maj. Burns, you gave some figures yesterday. What were your figures as to the cyanamid process?

"MAJ. BURNS: They are royalties which, in accordance with our contract, we would have to pay to the American Cyanamid Co. until the first of June, 1931.

"MR. MAGEE: Was that so much a ton?

"MAJ. BURNS: Yes.

"MR. MAGEE: What were the figures?

"MAJ. BURNS: For calcium cyanamid, $6.25 per ton; for ammonium nitrate, $11.56 per ton; and for ammonium sulphate, $6.77 per ton.

"MR. MAGEE: I understand from Dr. Parsons's statement that if fertilizer is manufactured under the Haber process those royalties would be nominal.

"DR. PARSONS: I think I can give you some fiures which will essentially answer your question.

"MR. MAGEE: Please put them in the record.

"DR. PARSONS: The Atmospheric Nitrogen Corporation expects to have to depend on the Haber patents but very little, if at all, but it will work under the patents of the General Chemical Co., which, in contracts with the Government, es-

tablished a royalty of almost exactly one-sixth of the royalty for the cyanamid process.

MR. BYRNS: Major, the contract to which you have referred extends until when?

"MAJ. BURNS: Those royalties would have to be paid to the 1st of June, 1921.

"MR. BYRNS: What after that?

"MAJ. BURNS: After that they are subject to arbitration.

"MR. MAGEE: And nobody knows what might be determined at that time?

"MAJ. BURNS: No; no one knows.

"MR. MAGEE: It might be a greater figure?

"MAJ. BURNS: Yes, it might be continued at a greater rate, or a lesser rate; we believe it will be at a lesser rate.

"MR. MAGEE: But you can not tell?

"MAJ. BURNS: No, sir. On the other hand, these royalties cease at the expiration of the patents, which expiration will take place early in 1931.

"THE CHAIRMAN: Not all of them.

"MAJ. BURNS: I think practically all expire as of 1931.

"MR. BYRNS: It is not likely that in the arbitration any price would be placed upon royalties that expire when the company ceases to have any right to sell that royalty.

"MAJ. BURNS: No; in my judgment, no one is going to pay for something he does not have to pay for.

"MR. BYRNS: In other words, they cannot sell it and will not sell it.

"MAJ. BURNS: No.

"THE CHAIRMAN: I have heard of the War Department doing that very foolish thing.

"MAJ. BURNS: I do not understand myself how the War Department helped to win the war with all the criticism that is heaped on it.

"MR. BYRNS: If the war had continued, I do not know where we would have been or what we would have come to, if the statements made here are true with reference to the cyanamid process."

Page 199:

"MR. BYRNS: If the Haber process to which you have referred is so much more superior to this cyanamid process, as you state, how would the operation of this plant interfere with private capital or any other interests in the installation of plants for the purpose of producing nitrogen by the Haber process?

"DR. PARSONS: I am glad you asked that question, because it is a very pertinent question. No private industry in this country, so far as I am aware, has the slightest fear of the operation of the cyanamid plant at Muscle Shoals and its production.

"MR. BYRNS: If you could see some telegrams that I am getting, you would think that some of them do fear it.

"DR. PARSONS: They would have no fear of the cyanamid plant if its product is to be sold at or above the actual cost, without a Government subsidy. They do have, however, a very great fear as to what may be developed from the other plant. If your corporation is to be given the authority that is contained in the proposed bill (and the dam is supposedly being built chiefly for the nitrogen plant) to do almost anything under the sun, they will have reason to fear it. Under that bill, the corporation can go into any form of nitrogen manufacture whatsoever without limitation and without reference to whether or not it has to do with fertilizers. It can go into the manufacture of dyestuffs, and it can go into the manufacture of anything that contains nitrogen or in any production that is pertinent thereto. For example, it could go into the manufacture of soda, which is used to such an extent in the manufacture of soap. Those two processes are now very closely allied. They have at Muscle Shoals the nucleus of an essential Haber industry; it is to be given Government funds; it has in Washington a very well regulated research laboratory run by some of the best brains of the country, and a laboratory which is being run absolutely secretly so that the corporations of the country and others

can not get the information they are developing. It is the only Government laboratory that I have any knowledge of that is run secretly with a view to a Government manufacturing corporation and where anything and everything that is developed is to be owned, controlled and operated by this corporation; a corporation which is to have more rights than the Standard Oil Co. ever attempted to assume even in the old days. It has the right to do anything."

Page 223:

"MR. BYRNS: Were you not one of the advisers of the Board and the most prominent advocate of the Haber process?

"DR. PARSONS: Well, I do not know that I was the most prominent, by any means.

"MR. BYRNS: I will put it in another way.

"DR. PARSONS: But I had many others who backed me in that final conclusion. And so far as the situation at Muscle Shoals is concerned, I am glad we did not have to depend on its output.

"MR. BYRNS: But you were one of the most persistent advocates of the Haber process?

"DR. PARSONS: And I am still.

"MR. BYRNS: And mechanical difficulties did occur there?

"DR. PARSONS: Yes, sir.

"MR. BYRNS: And it was not a success? They are conducting experiments yet, as I have understood from the previous hearing?

"DR. PARSONS: Yes, sir.

"MR. BYRNS: For the purpose of seeing whether they can not smooth out these difficulties and make it a success?

"DR. PARSONS: Yes, sir.

"MR. BYRNS: How many such plants are there in the United States, if any?

"DR. PARSONS: The only other plant that is going up—which has some similarities, but which is distinctly different and which is undoubtedly gaining information from the mistakes of the other plant—is this plant at Syracuse, which may

be enlarged to a very large plant, if the first installation proves successful.

"MR. BYRNS: How long have experiments and efforts been under way to successfully develop that process in this country?

"DR. PARSONS: On a commercial or laboratory scale?

"MR. BYRNS: I mean on a commercial scale.

"DR. PARSONS: The only output is that at the Muscle Shoals Plant, No. 1; the other plant has not yet begun to operate.

"MR. BYRNS: How long in a laboratory sense have those experiments been going on?

"DR. PARSONS: I do not know when they were begun, but certainly since the early part of 1916.

"MR. BYRNS: Certainly for the last four or five years?

"DR. PARSONS: Yes, sir.

"MR. BYRNS: And it has not yet reached that stage where a man can absolutely and emphatically say that it can be successfully applied in this country?

"DR. PARSONS: The Haber process?

"MR. BYRNS: Yes.

"DR. PARSONS: Oh, yes.

"MR. BYRNS: Well, it was not successful in the plant you recommended and that was put up on your recommendation.

"DR. PARSONS: We have not only the information gained from the work done in that plant, but we have information from Germany. At the present time there is in America, I am informed, full plans of the Merseburg plant, which is the latest plant built in Germany, and the patents are available for the use of anybody. Furthermore, the Claude process, which is along the same lines chemically, has been installed in France, and it looks very promising. There is no question but that if you give commercial interests half a chance America is going to have the biggest nitrogen industry in the world.

"MR. BYRNS: What do you mean by 'half a chance?'

"Dr. Parsons: Give them a chance so they do not have to compete against a plant which does not have any interest to pay or taxes to pay, Federal, State, or local, and which has the Government Treasury to call on whenever it gets short.

"Mr. Byrns: You understand that those who have appeared either here or elsewhere in advocacy of the manufacture of nitrates at Muscle Shoals propose to do it with the use of secondary power and through the cyanamid process?

"Dr. Parsons: Yes.

"Mr. Byrns: If that process is here and if the Haber process is going to be the process of the future, and if all commercial companies are withdrawing from the manufacture of cyanamid, it is difficult for me to understand just what any private concern like that with which you are connected, or any other concern which is interested in the Haber process, has to fear from a plant of that nature?

"Dr. Parsons: I thought I explained that pretty clearly, and my understanding is simply this: That they do not fear the cyanamid process nor any of the things which you have mentioned, but they fear a corporation without interest, without taxes, with the United States Treasury to draw upon, and with the privilege of unfair competition which you allow to no other corporation in the United States, having the right to go into any form of nitrogen production and carrying on the business in such a way as to prevent other companies from going into it. That if they did go into it with that competition, no company in this country could for one minute stand on its feet. The very threat of that will retard, if not entirely destroy, the development of the nitrogen industry in this country, and will at the same time destroy the war reserve which you and all of us wish to see developed in America.

"Mr. Byrns: You understand, do you not, that if that company is being formed—and as I have stated heretofore, it will require favorable action by the House to form it—it is being formed

for the purpose of operating Plant No. 2, with a limited amount of capital stock, and as I understood you a while ago, it would be impossible to turn Plant No. 2, constructed as it is, into a plant which would make nitrogen under the so-called Haber process.

"DR. PARSONS: But Plant No. 1 can be enlarged and anything can be done with it under that corporation and under that authorization, and with that money there is no limitation on that proposition at all.

"MR. BYRNS: Then, as I understand the point of your objection, the real underlying point of your objection here is the fear that that corporation may develop Plant No. 1 for the use of the Haber process and thereby furnish fertilizer to the farmers at a cost at which it will not be furnished them by private industries, such as the Atmospheric Nitrogen Co., and others? I think that is a very fair inference to draw from your statement, which you have made several times with reference to the Government doing business without taxes, etc.

"DR. PARSONS: I fully believe that the cheapest fertilizer will ultimately come to the farmers through the development of this industry in this country, as it will be developed, rather than through any such proposal as is made down there. I believe that the cheapest fertilizer will come through the synthetic or so-called Haber process. I have no doubt of that whatsoever. I have abso money to think for a moment of operating it.

"MR. BYRNS: We appear here, as I have stated heretofore, and we are here for the purpose of considering an appropriation to complete the dam, and that, as I understand you, has absolutely no relation to Plant No. 1.

"DR. PARSONS: You are quite right.

"MR. BYRNS: Because Plant No. 1, which is a plant for the Haber process, if operated successbelieve it is a tremendous waste of Government fully—and that, as I understand you, is a matter of some doubt.

"DR. PARSONS: I have not much doubt about

it, although there is some doubt; there is doubt about everything in this world.

"MR. BYRNS: Certainly, and that is the point as large as all the cyanamid plants of Germany lutely no fear of the cyanamid plant, but I do I was trying to make, and there is, to any reasonable man, at least, some element of doubt as to the final results of the Haber process.

"DR. PARSONS: No; not of the Haber process.

"MR. BYRNS: Well, there may not be any to you, doctor, as an experienced chemist.

"DR. PARSONS: The Haber process is a big success today; it has a capacity of 300,000 tons in Germany and is operating on a large scale.

"MR. BYRNS: In Germany?

"DR. PARSONS: Those plants are three times put together. It is operating very successfully there, and will certainly operate successfully in this country, if you give private capital an opportunity to go into the business.

"MR. BYRNS: Why was it that the plant at Sheffield was not a success?

"DR. PARSONS: I have tried to explain that it had to go through the incubation period, exactly the same as in Germany, and I have not any great doubt that Plant No. 1 is going to be a success. But if it is a success I do not favor the Government managing it and going in to produce fertilizers below the cost at which anybody else can produce them and give them to the farmer."

Page 239:

"MR. BYRNS: I want to read you this statement of the Secretary of War, who appeared very recently before this Committee. This statement is rather contradictory of the information which has come to you. In speaking of the mechanical difficulties that had to be overcome in this Plant No. 1 at Sheffield, Ala., he says this:

> "A highly obscure stage or step in the process is the catalyzation of ammonia from nitrogen gas; that requires the intervention

of a chemical agency known as the catalyzer, and we did not have a catalyzer which wore well, and the consequence is that in that process in its present stage of development we have need of further experimentation, and invention, perhaps, with regard to the discovery of better catalyzing agent and better control of the pressures. The plant can not be said to have failed, but it is not a distinguished success, and the scientific men who have been engaged on it and are still engaged on it believe that already the necessary discoveries have been made to overcome those difficulties, and that the plant will undoubtedly be available for the establishment of the process which in Germany supplied her with nitrates during the war."

"That, of course, is in confirmation of your position with reference to the availability of this process for the manufacture of nitrates; but at the same time, it shows that scientific men who are employed by the Government are still engaged in perfecting the catalyzer.

"DR. PARSONS: I have not any doubt whatever, Mr. Byrns, that scientific men, not only in the Government service, but at all these other plants, will be engaged for the next fifty years in perfecting a catalyst. I doubt if a perfect catalyst is ever discovered, and it is simply a question of getting nearer and nearer to a catalyst which is theoretically perfect. I believe that they think out at that plant that they have now the best catalyst in America. I am not prepared to say that they have, because there are no means of making a comparison; but that is also indicated in the latter part of Secretary Baker's remarks from which you have just read."

Page 242:

"THE CHAIRMAN: What is the situation, doctor, so far as a construction program is concerned in the world for the manufacture of fixed nitro-

gen, are there any cyanamid plants being erected in any place?

"Dr. Parsons: To my best knowledge there is none.

"The Chairman: Any Haber process plants?

"Dr. Parsons: Yes, sir; several.

"The Chairman: In what countries?

"Dr. Parsons: In England they are building a plant at the present time with a capacity of 100 tons of nitrogen a day, which is to be trebled in size. That means 400 tons of ammonium sulphate a day or 1,200 tons of ammonium sulphate when it has reached its final capacity, or, if you wish to put it in another form, that is 90,000 tons of fixed nitrogen a year, which is equivalent to 360,000 tons of ammonium sulphate, which is a very large plant, considerably larger than the plant at Muscle Shoals—a little over twice the size of the Muscle Shoals plant.

"The Chairman: Is that the same as the process in Germany?

"Dr. Parsons: I do not wish to say that it is identical with the one in Germany.

"The Chairman: On the same general principles?

"Dr. Parsons: It is what you call the Haber process.

"The Chairman: How about other countries?

"Dr. Parsons: Japan has purchased the Haber rights and also the General Chemical Co.'s rights. Whether they have started construction, I cannot say, but Japan is prepared to build Haber plants. America has this plant which is going up at Syracuse and there is a small experimental plant at Providence. Italy is considering now the introduction of plants and their expectation is for plants with the Haber process. At Terni there is already operating a small Haber type plant.

"Mr. Magee: Where is that?

"Dr. Parsons: About 50 or 60 miles out from Rome, in the mountains. In France the Haber patents have been purchased from Germany by a

syndicate which is preparing to erect Haber plants which, I understand, will be very much the same as the plants in Germany. Unless this Claude process develops more rapidly than expected—and the Claude process is a modification of the Haber—Haber process plants will be erected in France. The whole future development is along the synthetic ammonia line of attack."

MR. ANDERSON: In connection with the evidence read into the record on yesterday, to complete it, I would ask leave to read two sentences from the Hearing on Senate Bill 3390, page 26, the following statement from General Williams, who appears here as Chief of Ordnance.

MR. KRESEL: What is that?

MR. ANDERSON: Just a statement of General Williams, the Chief of Ordnance.

MR. KRESEL: Page 26?

MR. ANDERSON: Page 26, on that Senate Hearing, the following statement——

MR. KRESEL: Wait a minute, Colonel; who did you say referred to this?

MR. ANDERSON: I referred to General C. C. Williams, Chief of Ordnance, who was referred to a number of times yesterday in the testimony, and who testified in a number of these hearings, and at this hearing appeared with Secretary Baker.

MR. KRESEL: That is all right, Colonel, if you want to read anything from General Williams, or Colonel Williams, whoever it was, with the understanding that I shall have the right to read any other portion of his testimony and of any other witness's testimony produced by the War Department.

MR. ANDERSON: I think on yesterday, your Honor so ruled.

MR. KRESEL: That is all right.

THE COURT: I ruled it as against the Government.

MR. ANDERSON: Yes, sir.

THE COURT: I did not rule it in favor of the Government.

MR. ANDERSON: No, sir.

THE COURT: You have a different position, a different legal position.

MR. ANDERSON: I will offer to read into the record the following statement of General Williams, in respect to the matter of the Plant No. 1.

THE COURT: Can we abbreviate that by pointing to the record?

MR. ANDERSON: It is only one sentence.

MR. KRESEL: What page is this?

MR. ANDERSON: Page 26:

> "GENERAL WILLIAMS: It was a failure in this new process where the nitrogen and the hydrogen are welded together to form ammonia. It was a modification of the Haber process and worked at the lower temperature and at a higher pressure, but it was not correctly designed, and while we fixed some nitrogen, the output was so small that we could not consider it a success. That can be fully developed by witnesses who will go into all of the details."

MR. KRESEL: Will you put upon the record the fact that what you have just read refers to Plant No. 1 at Muscle Shoals?

MR. ANDERSON: Yes, I did. Plant No. 1 at Muscle Shoals.

I turn to page 29 of the same report, and this is all I have to read—a statement by Secretary Baker:

> "SECRETARY BAKER: The only process which has disappointed us at all was the

Haber process, at Plant No. 1, where we undertook to modify what we knew to be the German practice. They used very high pressures and low temperatures. We undertook to use lower temperatures with less pressure.

"SENATOR KNOX: Then the failure came because you did not follow the German process?

"SECRETARY BAKER: In that case I think that was so."

MR. MAHAFFY: If your Honor please, does Colonel Anderson want this upon the record? He has not so designated.

MR. ANDERSON: That was taken down in connection and as part of the testimony produced yesterday, and I want to make it complete.

THE COURT: But whether the stenographer shall spread it at large on the minutes is the question.

MR. ANDERSON: Yes, sir. I am not going to introduce the book just to get one sentence.

Yesterday, your Honor asked me to point out more specifically my objections to the hypothetical question asked, and I think probably this is an appropriate time to do so. Aside from the general objections applicable to all evidence, the objections in detail are as follows:

First, the evidence does not disclose that the witness had any experience in the art of fixing nitrogen in 1919, the date referred to; second, as to clause 3 of the question it does not appear that the General Chemical Company had developed any new process, the evidence shows that it was essentially and basically the same process. No patents of the General Chemical Company have been introduced in evidence. The question states a conclusion, that there was a new direct method, which is only to be derived from an interpreta-

tion of the facts, by the Court, and is not a statement of fact.

As to Clause 4 there is no evidence that the Claude process has been developed at this time or that any plant for the use of the same has been constructed. The question omits essential evidence of the defendant that the French Government has adopted the Haber process and contracted for the use thereof.

As to Clause 5 of the question there is no evidence of any lack of information as to the Haber process in the United States. The witness only stated in his opinion that it was impossible to manufacture, and his whole experience was advisory, as to what he claimed was a different process.

As to Clause 7 there is no evidence that the cost under the Haber process was greater than cyanamid, but the evidence of the witness in his official report given in 1917 is directly to the contrary. This report is the only evidence of cost which was in existence at the time stated in the question.

As to Clause 9 of the question it fails to include the essential evidence that the sources of supply named were not adequate to meet the demand in the United States during the life of the patent, and further evidence of the witness that the cyanamid was not competitive of the Haber process.

As to Clause 10 the question fails to take into consideration the evidence of skilled personnel of the General Chemical Company claimed to be in existence by the witness, the experiments of that company since 1916, or the evidence that they immediately thereafter constructed and operated a successful plant, showing the existence of skilled

personnel, as a result of their experiments and the experiments at Nitrate Plant No. 1.

As to Clause 11, the statement in the question is in direct conflict with the evidence of this witness, who states that Plant No. 1 was not a failure, but accomplished the purposes of its construction as an experimental plant and resulted in development of the process and solved the problem, and further states that it was constructed on a modified system and not strictly in accord with the Haber system and patents.

Further objection is made on the general ground that the question omits other material evidence in the record, including other material evidence of this witness, essential to a correct statement of the evidence upon which a hypothetical question can be predicated.

MR. KRESEL: Is it necessary that we argue this now, your Honor?

THE COURT: No. Do you desire to amend your question?

MR. KRESEL: No, your Honor; I do not.

CROSS-EXAMINATION (Continued).

By MR. ANDERSON:

XQ. 324. Dr. Parsons, turning to your report introduced in evidence as Defendant's Exhibit No. 177, I find on page 11 you state the advantages of the Haber system to be: (1) Cheap ammonia; (2) Ammonia in water free liquid condition, ready for immediate oxidation without purification; (3) availability of raw material, air, water and coal; (4) possibility of erecting comparatively small plants wherever needed; and (5) easy availability of product for transportation and for fertilizers. Those elements still exist, do they not?

A. They do not.

XQ. 325. Well, you so reported to the Government, did you not?

A. I so reported. Essentially, as to 1, 2, 3 and 5, I should not change the statement today. The possibility of erecting comparatively small plants I was mistaken about, referring to the Haber process per se.

XQ. 326. Assuming the validity of the Haber-Bosch patents, which you classified and introduced in evidence yesterday, those patents are of a broad scope, are they not?

A. Yes.

XQ. 327. It was a pioneer process, was it not?

A. Yes.

XQ. 328. The scope of these pioneer patents which I will call them for the sake of convenience, was broad enough to include many subsequent improvements, was it not?

A. It included everything they could think of, whether they were applicable or not.

XQ. 329. Is that not usual in patents of this kind?

A. To a certain extent, yes.

XQ. 330. You knew at the time that you testified on yesterday, I think, that the Atmospheric Nitrogen Company, which you have described, had taken out a license from The Chemical Foundation under the Haber patents which you introduced, did you not?

A. I do not think I so testified.

XQ. 331. I say, you knew it at the time you testified?

A. I have been so informed. I knew nothing about it.

XQ. 332. I read from your testimony on yesterday a statement that they had taken out licenses under the Haber patents?

A. I think they had. I was so told.

XQ. 333. Assuming these to be valid pioneer patents and as broad as you described, they afforded very

material protection to any manufacturer in the United States, did they not?

MR. KRESEL: Protection for what?

MR. ANDERSON: Protection as a manufacturer against claims for infringement or any other claims.

A. Yes.

XQ. 334. They would?

A. Assuming it.

XQ. 335. Yes, assuming they are valid. You knew as a matter of fact, did you not, when you testified on yesterday, that the Atmospheric Nitrogen Company was paying or had paid a royalty of $2,500 to begin with to The Chemical Foundation for the use of these patents, did you not?

A. I have no recollection of so testifying.

XQ. 336. But you did know it?

A. I did not know that they had paid a royalty of $2,500. I knew quite recently that they had taken out a license, but I did not know what the amount of that license was. I know nothing about its details.

XQ. 337. You know nothing about the details of the license?

A. No.

XQ. 338. In giving your answer to the question on yesterday, the hypothetical question, did you consider the statements contained in your report to the Government as to the cost of nitrogen?

A. I did.

XQ. 339. I mean the cost of nitrogen by the Haber process?

A. Yes, in Germany.

XQ. 340. Did you consider your statements given in the last report of April 30th, 1917, as to the cost in the United States based upon the letter which I showed you on yesterday?

A. By the General Chemical Company's process.

XQ. 341. Whatever the process was?

A. The General Chemical Company's process.

XQ. 342. Did you consider the statement contained in that letter and the report of April 30th, 1917, which you stated was based thereon?

A. Yes.

XQ. 343. Did you consider at that time your statement which I read to you yesterday in your testimony before one of the Committees, that the method of making pure hydrogen followed in the Haber German process and the so-called General Chemical Company process was basically the same?

A. Basically the same in reaction, yes, but not necessarily the same in process or patent.

XQ. 344. Did you consider the statement?

A. I considered it, yes, rather especially, because it is a rather important point.

XQ. 345. Did you consider in that connection your own evidence given on yesterday and the day before as to the efficiency of the present German catalyst?

A. I am not quite sure to what evidence you refer, Colonel. The present German catalyst is not nearly as efficient as the one that has been developed in America.

XQ. 346. Have you ever seen the present German catalyst?

A. No, I do not think I have, with any certainty. I have had material handed to me which was claimed to be a German catalyst and samples were brought back that were taken from the Oppau plant and were analyzed by the officers who were over there.

XQ. 347. Do you know that?

A. I was so told personally by the people who brought it.

XQ. 348. But you never have been in a German plant, have you?

A. I have not.

XQ. 349. And the only German catalyst that you ever got on the other side was a piece of iron that turned out afterwards had nothing to do with it?

A. I do not know whether it did or not, yet.

XQ. 350. You do not?

A. No. I think it is quite possible——

XQ. 351. I believe in the evidence that I read you on yesterday you stated that the Haber process was entirely successful in operation in Germany now?

A. Yes.

XQ. 352. In reply to the hypothetical question asked you on yesterday, you said that the patents in your opinion had no value whatever for manufacturing purposes. What do you mean by "manufacturing purposes"?

A. I mean that the patents had no value to any one in America who wanted to manufacture ammonia by the synthetic ammonia process; that there were much better methods of procedure which did not come under the patents, and that frequently in my use of the word "Haber" I have used it in a generic—

XQ. 353. I have asked you what you meant by "manufacturing purposes." I did not ask you to explain your former testimony.

THE COURT: Have you finished your answer?

THE WITNESS: I have not.

THE COURT: Do not refer to your previous evidence or attempt to explain it in this answer. You may otherwise complete your answer.

A. (continuing) I meant by that that there was nobody in America who knew how to operate the Haber patents; that the know-how was absolutely lacking so far as we were concerned, and that the Haber patents had been very largely superseded.

XQ. 354. Now, let us see. Have you ever yourself manufactured synthetic ammonia?

A. Yes.

XQ. 355. Where?

A. At Saltville, Virginia.

XQ. 356. From the Haber process?

A. No.

XQ. 357. From the General Chemical Company process?

A. No.

XQ. 358. Therefore you have never manufactured synthetic ammonia on the Haber process or the so-called modified Chemical Company process?

A. Not personally manufactured it, but I have been in an advisory capacity to most—

XQ. 358. (Continuing) I did not ask you——

MR. KRESEL: Let him finish his answer.

MR. ANDERSON: If your Honor please, I am perfectly willing for the witness to finish, if he will answer my question and stop.

THE COURT: I think that was responsive.

A. (continuing)—of the operations that have been undertaken in America.

MR. ANDERSON: I asked him if he had personally manufactured it. I did not ask him about his advisory capacity, because that takes me right back to the whole examination that was had on yesterday, to explain what his advisory capacity means and what it was. We went over that yesterday.

THE COURT: Strike it out.

MR. KRESEL: You mean, your honor strikes out that portion beginning with the word "but"?

THE COURT: Yes.

XQ. 359. According to your view, the Haber process would afford no protection and no value to a manufacturer in the United States.

THE COURT: You have been over that Colonel Anderson. I am going to ask you not to repeat.

MR. ANDERSON: All right, your Honor. I withdraw the question.

THE COURT: You put that identical question once before this morning.

XQ. 360. Now I will ask you as to the patents which you introduced on yesterday. After putting in the six classes which you described or classified, you were asked the question whether, in February and March, of 1918, it was possible for anyone in the United States skilled in the art to manufacture ammonia by simply following the processes described in the patents which were put in evidence, and you said it was not known in any other country except Germany. I assume, Dr. Parsons, you will admit that you are not familiar with what can be done in other countries; are you?

A. I think I am fairly, yes; as much as anyone could expect to be.

XQ. 361. Do you know of your own knowledge what England is doing today?

A. I do.

XQ. 362. Of your own knowledge?

A. Of my own knowledge.

XQ. 363. Have you been over there in the last year?

A. I was over there in 1922, and I have been in close contact with the experts that are handling the new plant just going up at Billingham, in England, and I know pretty intimately what they are doing there.

XQ. 364. Do you know of your own knowledge what France is doing under the contract which was made yesterday? Yes or no, please.

THE COURT: Just a minute.

MR. KRESEL: You mean "introduced yesterday"?

THE COURT: Won't you have that question read?

MR. ANDERSON: "Made," I see.

XQ. 365. The contract that was introduced on yesterday.

A. Yes.

XQ. 366. Do you know of your own knowledge what France is doing under that contract; yes or no?

A. I have letters informing me as to what is going on, and direct reports from experts.

XQ. 367. I will ask you: Have you personally ever tried to manufacture synthetic ammonia under the fifty-eight patents which you introduced on yesterday?

MR. KRESEL: This question was asked less than ten minutes ago and answered.

THE COURT: I think this is slightly different, Mr. Kresel.

MR. KRESEL: Very well; I shall not press it.

MR. ANDERSON: No, sir; dealing with an entirely different situation.

THE COURT: Will you read the question?

(XQ. 367 repeated as above recorded.)

A. I have not.

XQ. 368. I believe you stated on yesterday that so far as your knowledge went, the General Chemical Company was now making synthetic ammonia under their modified process, as you call it?

A. Yes.

XQ. 369. I will ask you, first, to take your Group No. 1, containing fourteen patents for the manufacture and purification of hydrogen, which you introduced on yesterday, and point out in detail the method of manufacture and purification of hydrogen as provided

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by those patents, and the deficiencies therein which in your view make it impossible to manufacture and produce hydrogen under those patents?

Mr. Kresel: I do not think, your Honor, that we should be asked to spend the time here in having this witness read from a lot of patents. The patents speak for themselves and can be read by the Court as well as by this witness. Therefore, I object to the question as immaterial and irrelevant, and as useless and as a waste of time.

Mr. Anderson: If your honor please, counsel took an entire day to examine this witness on direct and asked a very general question here to which I objected on the ground that it called for a conclusion which was not based upon a proper foundation, and undertook in that way to attack, if not the validity, as he said he was not attacking the validity, at least the usefulness of these patents. I am just as reluctant as anybody in the world to go into this subject. I am objecting to all this evidence as immaterial and irrelevant.

The Court: You mean on the ground that it does attack the validity of the patents?

Mr. Anderson: That would be the ground of estoppel. I object to it on the grounds stated in my motion and objection of yesterday, which I will not repeat; but it is immaterial and irrelevant in this case because the defendant itself is on the record admitting that these patents are of great value, and therefore, it cannot come on the record now and try to attack their value. It is utterly immaterial what these experts may think. This defendant is bound by this record, as it stands today, admitting these patents to be of very great value at the time they were bought. There-

fore, we are brought here to try a series of infringement suits, in which we have been engaged now for a week, and there is promise of our being engaged in them a good deal longer. If the Government has got to meet that case, if your Honor please, I will have to meet it. Nobody hates it more than I do. It is not my fault, and I do not want to take up the time here; but I have a duty to perform, and I do not think I can abate that duty one jot or tittle and discharge my obligations to the Government.

Mr. Kresel: I thought, your Honor, we had agreed upon one thing, if upon no other, in this case, and that is that the question of the value of these patents was something that the defendant had a right to put in testimony about. I think on the very first day your Honor summarized our opposing contentions, and your Honor remarked that in so far as the Government's position was concerned, it recognized that the defendant had a right, and indeed it claimed that the defendant had the duty and the burden of showing the value of these patents. Does the Government now take the position that we have no right to put in evidence as to the value? The trouble is, your Honor that the position of the Government is shifted from time to time so quickly that we can hardly keep step with it.

Mr. Anderson: Counsel devoted a good deal of attention to the charge that the Government is shifting and is commenting upon it constantly. I think if counsel will go back over this record, he will find the Government's position has not changed an iota from the first day, and will not change from that which is stated in the Bill. I have stated in this record at least a half a dozen

times that in my view as counsel (my personal view has nothing to do with it) the question of value in this case is absolutely immaterial. I have stated that. I have stated it for the reason that the present relationships of these parties, of buyer and seller, make this thing absolutely invalid and should be challenged by the Government if they had paid a hundred million dollars.

THE COURT: Let us test that, Colonel Anderson, because either you are wrong or I am laboring under a misapprehension. Do you not set forth inadequacy of value in your Bill?

MR. ANDERSON: I do, sir.

THE COURT: Do you not also set forth the other ground which you state?

MR. ANDERSON: I do. I do not think I am confined to one of them.

THE COURT: You stand on both of them?

MR. ANDERSON: I do. I stand on half a dozen here.

THE COURT: But my difficulty is this, Colonel Anderson—how you can contend, when you have set forth inadequacy of price as one of the grounds for setting this aside, that it is immaterial because you have set forth another ground.

MR. ANDERSON: For this reason: I contend that you will never reach it, and therefore, that the first proposition settles this case; but I do not think, as your honor does,—

THE COURT: We can settle this in just a moment. Do you now desire to amend your Bill, striking out all allegations with respect to inadequacy of price?

MR. ANDERSON: I do not, sir. I stand on every line of that Bill with the exception of the allegations that have been stricken out.

THE COURT: Then let me ask you another question: Do you still insist that the testimony with respect to the inadequacy of price is irrelevant and immaterial in this case?

MR. ANDERSON: I said, in my view as counsel, this case will be settled by a legal principle before it reaches the question of inadequacy of price.

MR. KRESEL: But you are not answering the question.

MR. ANDERSON: If your Honor please, I think I can answer your Honor's question without the assistance of counsel.

THE COURT: Go ahead.

MR. ANDERSON: And I still think that that legal principle will control. But I have got to present evidence which will support any legal principle set up in that Bill. The Courts do not always agree with me and I must therefore present a case which will meet any legal view that can properly be raised with respect to this transaction; and therefore, I went into the question of value, although I stated my position clearly at that time. I went into the question of value to some extent. I also stated, I think, that the burden, if the question of value arose, was on the other side; and now that the question of value is raised,—

THE COURT: You raise it, Colonel Anderson.

MR. ANDERSON: All right, sir, I am perfectly willing to raise it, and I do raise it. I will have to argue that question to your Honor when we get to final argument, and whatever your Honor's view is, why, of course, it may not be mine. What I am contending for now is that since counsel have asked the question as to whether or not these patents can be used in the United States, I am

entitled to go into those patents and ask this witness to explain the details thereof and to explain the systems and variations therefrom. If we are going to try an infringement suit, we ought to do it.

THE COURT: We will only take just a moment longer; but let us see if we can expedite this case just a little bit.

MR. ANDERSON: Yes, sir, I will do my best, sir.

THE COURT: And I am sure I will have your assistance.

MR. ANDERSON: You certainly will, sir.

THE COURT: Is it disputed on the part of the Government that at the time of this sale there was exceedingly grave doubt of—let us call it the workability of these Haber patents, in the United States?

MR. ANDERSON: Is that disputed?

THE COURT: Yes.

MR. ANDERSON: Absolutely, yes, sir. There was no doubt, in our view, as to the workability of these patents, and one of the chief and moving causes for this whole transaction was to get control of these patents. There is no question about that.

THE COURT: Let me ask you one other question: Is it your contention that these patents have brought in any revenue to the Trade Commission or to the Chemical Foundation or that there has been any practical development under these patents in the United States until now?

MR. ANDERSON: Your Honor's question is a double one. I will answer the first half, first. The amount of revenue brought in—the matter is pretty clearly proved—is $2600 under these pa-

tents; but the owners of the patents practically are the licensees, and they are claiming to use a slightly modified process and are successfully operating under that process, which we believe to be an absolute infringement of the Haber patents; and nobody is going to inquire about it, because nobody is interested in inquiring. Therefore, of course, they reduce the value by reducing the revenue. That is simple.

MR. KRESEL: Is there any proof of that, your Honor?

MR. ANDERSON: Well, we are not through with this case yet.

MR. KRESEL: Very well.

THE COURT: I agree with you, Colonel Anderson, clearly in this particular—that I did not believe we are going to reach this testimony that is now called for in deciding this case, but in carrying out our general rule I am going to let you take it.

MR. ANDERSON: Yes, sir. I hate to take it, if the Court please; it is a most laborious task.

THE COURT: We will have to have evening sessions. There is no escape from that.

MR. KRESEL: May we have the question read now?

THE COURT: Yes, and the answer.

(XQ. 369 read as recorded above.)

MR. KRESEL: I will ask the Clerk to hand the patents to the witness. (Clerk complies.)

THE WITNESS: We will be here a month, Colonel.

THE COURT: I beg your pardon?

THE WITNESS: I say we may be here a month.

THE COURT: Take such time as you need.

A. With reference to Patent No. 1,196,101, it is apparently a simple—

XQ. 379. That is the first one, is it not?

A. It is, as handed to me here. This is a simple patent for treating gases in iron apparatus with a solution of cuprous chlorid containing such proportion of ammonia that the iron of the apparatus remains unattacked. I am not prepared to say, as would be the case with many of these other patents, that any one can not pass ammonia gas under these conditions through cuprous chlorid, but this patent, in this procedure, is not essential to the Haber Process, is in my opinion not used at all in Germany or in any other part of the world and would be of no value whatsoever in any plant in this country or in any other country.

XQ. 380. I will ask that the question be reread. Do you understand the question, Doctor?

A. I am supposed to try to tell, as I understand it, why these patents have no value and are not available for synthetic production of ammonia, and are not necessary, or by certain detail are inoperable so that they are not required for use in this country.

XQ. 381. I did not ask that question. I have not used the word "value." I asked you to point out scientifically and chemically why hydrogen gas could not be made under those hydrogen gas patents, and that is all. I did not ask you whether it could be made in Germany; I asked you the simple question why it could not be made in the United Sates and whether it could be made under those patents.

MR. ANDERSON: I move to strike out the preceding answer and to have it re-read, and ask that the witness answer it directly.

MR. KRESEL: It seems to me the answer was responsive.

THE COURT: It need not be stricken out. I will deny the motion.

What have counsel to say as to the appointment of a Master to take testimony with respect to the infringement of the Haber patents? Only four weeks were asked for the trial of this case and it is now in the seventh week, and if we are going into the trial of the infringement of the Haber patents, which is not a question, as I see it, of the duty of the Alien Property Custodian or Mr. Polk or the President of the United States to try these patent infringement cases before they acted with respect to the sale of these patents, it will have to be referred. It seems to me that a Court in the trial of this case can only determine this matter, not from a trial of the validity of these patents or of their theoretical ability to work, but on the theory that the issues under the circumstances of this case and even under the Bill are different. I shall not preclude the Government from insisting this is an infringement suit, particularly with respect to the Haber patents; but I am going to refer that to a Master as a separate and independent matter involved in this case if it is pressed. You may press it or not, Colonel, as you wish.

MR. ANDERSON: I am not the slightest bit interested in it, sir, except with respect to the answer of the witness on cross-examination, and I would like to call your Honor's attention to the record of yesterday, if your Honor will permit me, so you will understand why I am asking the question.

THE COURT: I am not criticizing you, Colonel Anderson, but I am saying I have not imposed any restrictions on counsel in this case, I have considered counsel's convenience only. I have reached the point now, since this case has run more than its

allotted time, where I have to consider the interests of other litigants in this Court. You may go into and try the infringement suit as much as you like, I am not questioning by anything I have heretofore said your right to do it. I have said you may try that issue, but I shall refer that issue to a Master.

MR. ANDERSON: Here is the purpose of my question, that your Honor may understand my position.

THE COURT: I am not criticizing.

MR. ANDERSON: (Reading) "Q. 140. Dr. Parsons, in February, March and April, of 1919, was it possible for any one in the United States skilled in the art to manufacture ammonia by simply following the processes described in these patents that have been this morning put in evidence?

"MR. ANDERSON: I have to note an objection to that, sir, because it calls for a conclusion.

"THE COURT: I am wondering how we will get at that fact, Colonel Anderson, if not by that question. I assume it calls for a negative answer; and just at the moment I do not happen to think of any way in which it could be done. I therefore overrule the objection.

"A. It was not; nor in another country except Germany."

THE COURT: I am not critizing your position at all.

MR. ANDERSON: That forces the Government into a detailed examination of what that means.

THE COURT: I am not questioning that and I am not considering that; but I am simply saying that if we are going into the trial of the theoretical validity of these patents or their workability, to use a general term, in the United States, I am going to refer that issue to a Master. I am not

trying to drive counsel to any position at all, but I am taking that position for the protection of other litigants in this Court. Counsel may decide what they want to do. I will ask that the answer to that question, if pressed, be taken before a Master.

MR. ANDERSON: Then, if your Honor please, I shall not, of course, ask for a further answer to that question at this time, and I was going to examine the witness and see if I could possibly avoid it.

THE COURT: I am not asking you to avoid it. I want you to understand my position, that you are at liberty to take any position you like. That question may be gone into fully, although so far as I now can see it would have no part whatsoever in the decision by me of the issue in this case.

XQ. 382. Doctor, what is the method of making hydrogen in the United States?

A. There are two methods.

XQ. 383. Pure hydrogen.

A. Three methods, instead of two. Probably the most applicable method to American conditions, where cheap power can be obtained, is the production of hydrogen electrolytically by the passing of a current of electricity through water containing an electrolyte. That method is being used, furnishing hydrogen, through some of our electrolytic plants, and a few small plants for the production of ammonia are being installed to utilize that electrolytic hydrogen. It is proposed in case the plant is re-operated at Muscle Shoals, and was even before the war closed, that the water power at Muscle Shoals should be used to produce hydrogen in that way, because it gives immediately and directly hydrogen of a high degree of purity, and a very large part of the expense of operating Plant No. 1 at Muscle Shoals, at Sheffield, was due to the

necessity of purifying the hydrogen that was made by the process and that worked with very great difficulty.

There is another method which has been developed for the production of pure hydrogen on a large scale which is probably the cheapest of all for American conditions, and that is separating hydrogen from coal gas by fractionating the gases therein in the liquid condition, a method which gives very great weight to the Claude process and patents, and is the one that I have for some time had in mind in case a synthetic ammonia process was established in this country on a large scale. Both of those are entirely independent.

XQ. 384. I have only asked you what was the method followed in the United States. We will stop right there. And in addition, I have allowed a good deal of latitude on that feature.

MR. KRESEL: I thought you said there was a third one.

MR. ANDERSON: No, he said there were two.

MR. KRESEL: No, he changed that.

THE WITNESS: I corrected that. There are three.

MR. ANDERSON: I am perfectly willing to have the methods employed in the United States, but I do not ask for a comparison.

A. I must have misunderstood your question, Colonel, because the Claude method is not now employed in the United States.

XQ. 385. I have asked you about the United States. Let us stop right there.

A. But it can be employed in the United States any time that it is wanted or needed. The second method that is now employed in the United States I am not quite certain about. I know its general re-

actions are essentially the same, basically the same, as those employed in Plant No. 1 at Sheffield. Just how it has been modified I do not know because I have not seen that portion of the plant; but I do know in general the reactions, if you wish to have them.

XQ. 386. The only one, then, that you know of in producing pure hydrogen in the United States and now employed in the United States is the electrolytic method that you have described?

A. The only one that I have actually personally seen operating, except that I did see the operation in Plant No. 1 at Muscle Shoals, which does not differ very greatly from the process that is now operated in Syracuse, as I understand it.

XQ. 387. But do you know what the process in Syracuse is?

A. I do not know the details of it. I know the basic reactions which are used.

XQ. 388. And that is substantially the same as that employed at Muscle Shoals?

A. So I understand. They made certain changes and modifications in order to get the gas of a proper purity, which they did not succeed entirely in doing at Sheffield.

XQ. 389. Is there any serious chemical difficulty in producing hydrogen of a pure character?

A. Not electrolytically. These are very great difficulties in obtaining it by the method which was employed at Plant No. 1 at Muscle Shoals.

XQ. 390. There was difficulty there?

A. They were considerably overcome by the operations which were carried on there as a part of the development of the plant.

XQ. 391. I believe you testified that the plant at Syracuse was operating perfectly from the day its wheels started to turn.

A. Yes.

XQ. 392. And they are producing pure hydrogen by substantially the process at Muscle Shoals, with slight modifications, as you are informed?

A. They are not producing pure hydrogen. I know of no way of getting really pure hydrogen except electrolytically. They are producing hydrogen which is pure enough to make ammonia, but not nearly as pure as they would like to have it.

XQ. 393. But by the electrolytic process you produce a pure hydrogen?

A. An extremely pure hydrogen. I would be glad to go into the details as far as I know them.

XQ. 394. I do not want them further. Can you point out, without referring to the patents—of your own knowledge, now, and without speaking from hearsay—the difference between the Haber process and the so-called chemical process used at Syracuse? I only want your own knowledge, Doctor; I do not want hearsay.

A. Do you mean that I have been to and worked the Haber process in the German plants and also been in the Chemical Company's plant and worked it? or have such informaion as—

XQ. 395. I mean the difference between the two.

Mr. Kresel: Do not interrupt him. What is the rest of your answer?

A. I am not trying to bring in any information, I am simply trying to understand what you mean by my own knowledge. I have never worked in a Haber plant, have never personally made synthetic ammonia in any plant, so of my own knowledge, so far as my own fingers are concerned, I can say no.

XQ. 395a. Do you know the process employed by the General Chemical Company at Syracuse today? or the Atmospheric Nitrogen Company?

A. In general, but not in detail. I have never been in their plant.

XQ. 396. Do you know the constitution or methods of making the catalysts used by the General Chemical Company?

A. I do not. That was carefully concealed to two people.

THE COURT: Do you mean disclosed to two people only?

THE WITNESS: I mean that it was developed by one man and another man was allowed to know about it, and those two so far as I understand are the only people in the General Chemical Company who have any knowledge of how that catalyst is prepared or made.

XQ. 397. Doctor, have you ever read all of these Haber-Bosch patents, 58 of them, that have been introduced in evidence?

A. I have read every one of them, Colonel.

XQ. 398. When did you read them?

A. I read most of them within the last two weeks, shortly after your representative came to see me in Washington and wanted me to testify to their value.

MR. ANDERSON: I move that the last part be stricken out. I asked him when he read them and he deliberately injects into it another statement.

THE COURT: It may be stricken out.

XQ. 399. When did you read the others?

A. There are no others. Just fifty-nine.

XQ. 400. You said you read most of them in the last two weeks. When did you read the others?

A. Oh, I have read some of the more important ones as they came out.

XQ. 401. All of them came out prior to 1917, did they not?

A. No. One of the most important ones came out in 1923.

XQ. 402. Then it was seized as an application and perfected by the Chemical Foundation; is that true?

A. That is right.

XQ. 403. Are there any others have come out since 1917?

A. I think so; quite a number of them. They were all open to the officers of the Government, however, during the war, for use.

XQ. 404. Did your answer in response to the question as to the possibility of use apply to all the patents in each of the groups, the six groups you defined?

A. Do you mean that I intended to say that there was no patent in the 59 that we might not have operated, whether valuable or not, in case we had desired to do so? I should have answered you no, because I think possibly there are some of them could be utilized if there was any reason to do it.

XQ. 405. The making of nitrogen is a perfectly simple process, is it not?

A. It is not a question of making nitrogen, it is simply a question of separating the gases which are present in the air.

XQ. 406. That is done through the liquid-air process?

A. Done through the liquid-air process, and is available to any one—done by a number of processes successfully.

XQ. 407. Have you ever undertaken to make a catalyst for the fixation of nitrogen yourself?

A. Not personally, no.

XQ. 408. Have you the patents of the General Chemical Company, to which you have referred?

MR. KRESEL: I have them right here.

MR. ANDERSON: Are you going to offer them?

MR. KRESEL: I will be very glad to offer them now.

With your Honor's permission, at Colonel Anderson's suggestion, I now offer in evidence five United States letters patent, issued to various people there, which are known as the General Chemical Company patents. I shall not stop to describe them, but ask that each of them be given a separate exhibit number. There is a sixth of which I have not as yet been able to obtain a copy; and I ask leave now, as soon as I get the copy, to introduce it. It is No. 1,143,363.

THE COURT: To be supplied.

MR. KRESEL: If your Honor will permit, I ask that the Clerk assign an exhibit number thereto and I shall supply it.

THE COURT: Admitted.

Patent No. 1,141,947, received in evidence and marked "Defendant's Exhibit No. 240." (*See Patent Exhibit Book.*)

Patent No. 1,141,948, received in evidence and marked "Defendant's Exhibit No. 241." (*See Patent Exhibit Book.*)

Patent No. 1,151,537, received in evidence and marked "Defendant's Exhibit No. 242." (*See Patent Exhibit Book.*)

Patent No. 1,159,364, received in evidence and marked "Defendant's Exhibit No. 243." (*See Patent Exhibit Book.*)

Patent No. 1,159,365, received in evidence and marked "Defendant's Exhibit No. 244." (*See Patent Exhibit Book.*)

Patent No. 1,143,363, received in evidence and considered marked "Defendant's Exhibit No. 245." (*See Patent Exhibit Book.*)

MR. ANDERSON: I want to ask one question which may come within the scope of your Honor's ruling, but in asking it, I do not mean to be violating the rule.

XQ. 409. I will ask you to take the patents which have just been introduced, generally styled the General Chemical Company patents, defendant's Exhibits 240 to 245 inclusive, to describe in detail the processes provided therein and distinguish the same from corresponding patents of the Haber-Bosch process, 58 of which were introduced by you on yesterday.

MR. KRESEL: May I make the suggestion, your Honor that that is a matter that any one can read. Both patents are in the same language and your Honor is as able to see the differences by reading them as Dr. Parsons.

MR. ANDERSON: To which I reply, that they involve technical knowledge and terms which, since the witness has undertaken to testify that they are distinct, I am entitled to, but of course subject to the limitation of taking the evidence which your Honor has prescribed. I am entitled to have the witness show, so far as his knowledge goes and his opinion goes, the points where they differ; but I recognize that it may come within your Honor's ruling.

THE COURT: If you want this witness to state generally something that he may state in five or ten minutes, the difference beween the two processes, he may do so, but if you mean to elicit what your question calls for, a difference in detail, then the Master may take that answer.

MR. ANDERSON: May I confer with Mr. Knight for a moment, sir?

THE COURT: Yes.

MR. ANDERSON: (After consulting) I would

ask the witness to give a short answer, if he can.

THE COURT: Won't you repeat the question and strike out the words "in detail?" What you want now are the essential differences.

MR. ANDERSON: Yes, and if that requires additional detailed information of the patents we will take it in the other way.

XQ. 410. Can you at this time, having the group of so-called Haber-Bosch patents, 58 of which you introduced, and the so-called General Chemical Co.'s patents, which have just been introduced, before you, state briefly the essential differences in process?

A. I never read the General Chemical Company patents, but if you wish me to refer to the patents, I shall have to read them first. I was acting simply on questions of process with them and any questions on their patents they referred to their own patent experts, and they have some of the best in America, and they reported that there was no conflict between the process which they were developing—

MR. ANDERSON: I move to strike that part out from the record.

THE COURT: Strike it out.

XQ. 411. I asked you if you could state the essential differences in process between the Haber-Bosch patents and the General Chemical Co. patents. You say you have never read the General Chemical Co. patents?

A. That is correct.

MR. ANDERSON: I ask that that be his answer and that all else be stricken from the record.

THE COURT: Motion granted.

XQ. 412. The next question is this, whether you can state what is the essential difference between the processes and methods described in the Haber-Bosch patents, 58 of which you have introduced, and the proc-

ess employed by the General Chemical Company at Syracuse?

A. The basic difference is—

XQ. 413. First I will ask you whether you can state that difference?

A. I can.

XQ. 414. Then I will ask you to state the difference between the two, as you understand it?

A. The basic difference is that the General Chemical Company operates below 100 atmospheres pressure.

XQ. 415. Would you stop right there? That is the basic difference?

A. That is one of the basic differences.

XQ. 416. Do you know that of your own knowledge?

A. Do you mean if I have measured the gauges, etc.?

XQ. 417. Yes.

A. I have not.

XQ. 418. You do not know what the pressure is that they are operating under today?

A. I think I do, yes, as well as one honorable man can tell another.

XQ. 419. I am now asking you, Doctor, what you knew. The other honorable man I will ask when he comes. You do not know?

A. I have not operated the General Chemical Company's process or any other synthetic process anywhere.

XQ. 420. And you have never been in the General Chemical plant at Syracuse?

A. I have not.

XQ. 421. Then you can not answer the question, can you? I mean of your own knowledge?

A. Not on your basis, no.

MR. ANDERSON: If your Honor please, reserv-

ing the right later, if we determine after conference that we desire it, to take the detailed evidence on the question of these patents which have been introduced this morning and such other evidence as may be necessary on that line of examination before a Master, if your Honor should so direct, I will not ask the witness any further questions.

MR. KRESEL: I think, sir, that we are entitled to know now whether the Government desires to proceed further before a Master with this witness, because that will have an effect upon any re-direct examination that we may desire to make.

THE COURT: Then we will suspend and give you an opportunity to confer, Colonel Anderson.

MR. ANDERSON: If your Honor please, I think the right of re-direct examination before the Master would be the same as here, and I think we are entitled to a reasonable time in developing the evidence to see whether it is necssary for us to go to the trouble and expense of involving in this record a detailed examination of this question by this witness before a Master if your Honor is going to refer it to a Master, we could not take it now anyway. I suppose we could go on and conclude the case before the Court. I do not want to put the parties to the expense of taking up the time and doing the labor of a detailed examination of this evidence unless on careful reading of the testimony given, it seems to be an absolute necessity.

I do not see that anybody can be prejudiced if the matter is left open for re-direct just as fully before a Master as on cross-examination here. I have not made the slightest suggestion that it should be closed on either side. How can anybody be prejudiced by that condition?

MR. KRESEL: I can not see it that way. I am very sorry. I want any re-direct that I have of this witness to be had before the Court. Of course, if the redirect is to be based upon any testimony taken before a Master, I want to be advised about that before I proceed with my re-direct. If counsel desires some time to consider that question, I suggest that it ought to be sufficient time for counsel to determine that question after the noon recess. I shall ask your Honor to let Dr. Parsons wait over and when the Government makes up its mind as to what it wants to do, I shall then determine whether I want to ask any re-direct or no. I have another witness whom I can call. It will not delay anybody.

MR. ANDERSON: I respectfully suggest, if your Honor please, if you Honor is going to refer this matter to a Master, counsel have the same right to re-direct before the Master as we would cross-examination and that will relate solely to the matters which your Honor will refer to the Master by your decree. We have not touched on any of these matters except in this general way and I can not see how anybody can be prejudiced by our having time to consider this record, as to whether that laborious task shall be gone into in the first place. Nor can I see why the re-direct could not be finished as far as the cross has gone.

THE COURT: I think you are right that far, Colonel Anderson, that the re-direct, so far as the cross-examination has gone, is a matter that should be gone into now. The re-direct on such questions as you may ask before the Master, if any, should be before the Master. So I will hear such questions in re-direct testimony as you have now, Mr. Kresel. But the time for determining whether there is to be any other cross-examina-

tion of this witness is now and not at an indefinite future and "now" may be extended until one o'clock Standard time. At that time I shall be glad to have your answer as to whether you want to cross-examine this witness further.

MR. ANDERSON: Very well, sir.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 422. Dr. Parsons, upon your cross-examination, Colonel Anderson asked you what your experience had been prior to your entry into the public service in 1911. You were not asked to state what your experiences were subsequent to that time. Will you state them, please?

MR. ANDERSON: I wish to note an objection. If I did not ask about it subsequent to that time, counsel did ask about it subsequent to that time in qualifying the witness. Therefore, there is no re-direct on that point.

THE COURT: Did you not go fully into that, Mr. Kresel?

MR. KRESEL: No, your Honor. The question on cross was directed to his experience with reference to industrial ventures, your Honor will recall.

THE COURT: It is that, you are asking him?

MR. KRESEL: That, entirely.

THE COURT: I did not understand the question.

MR. ANDERSON: I limited it to 1911. How can he re-open on direct examination when I limited it to 1911?

THE COURT: The experience prior to 1911, stopping there, is of no value.

MR. ANDERSON: It may not have, but there is where it is limited.

MR. KRESEL: I withdraw the question.

THE COURT: If you inquire only as to the time when he had no experience and do not inquire as to the time when he had, it would be of no value.

MR. ANDERSON: He was examined on direct, sir, on that.

MR. KRESEL: I withdraw the question.

RDQ. 423. Dr. Parsons, Colonel Anderson read to you a number of passages from records of testimony that you gave before various committees. You stated at one point that you thought the Haber process was the process of the future. Do you remember that?

A. Yes.

RDQ. 424. In saying that, did you refer to any particular synthetic ammonia process?

MR. ANDERSON: I object on the ground that the witness can not explain his testimony.

MR. KRESEL: Can not explain it upon re-direct?

MR. ANDERSON: No, sir.

THE COURT: Objection overruled. You may take the answer.

A. May I have the question again.

(RDQ. 424 repeated as recorded above.)

A. No, I referred to the Haber process generically, taking in all of its modifications; that is, the direct combination of nitrogen and hydrogen; that that procedure would be used in the preparation of fixed nitrogen.

RDQ. 425. When, therefore, you testified as read yesterday that the synthetic ammonia process can produce cheaper than any other process and that the Haber plants will be operating soon in the United

States, to which synthetic ammonia process were you referring?

THE COURT: Same objection; same ruling; and exception.

A. That testimony was testimony which I gave in the early part of 1919, if I remember correctly. That was at the time I was being consulted, asked to come in among the consultants of the General Chemical Company; and I had their plant and process at Syracuse in mind.

RDQ. 426. And was that the one you were referring to?

A. That is the one I was referring to, as the context will very plainly show.

RDQ. 427. Testimony was read to you and also, your attention was directed to your report made to the War Department with reference to costs as between the different processes. All those costs, according to your testimony, in that report, were estimated costs only?

A. Certainly.

RDQ. 428. You had not before you any figures as to actual costs, had you?

A. I had not. They were unobtainable anywhere. I should like to modify that, as that was a broad question. With reference to the cyanamid process, I did have actual figures of the plants in Europe.

RDQ. 429. But I mean the synthetic process?

A. No.

MR. ANDERSON: Each of these questions, of course, is subject to the same objection.

THE COURT: Same objection and ruling.

RDQ. 430. You recall the letter that Colonel Anderson put in from the General Chemical Company to you?

A. I do.

RDQ. 431. Were the figures given there actual costs or estimated costs?

MR. ANDERSON: I object. The letter speaks for itself. He can not say what the writer was giving. If they say "estimated," or whatever it is, the letter speaks for itself. He can not explain the letter.

THE COURT: What does the letter disclose?

MR. KRESEL: I withdraw the question.

"We herewith submit the figures asked for by Mr. Noyes (I am reading from Plaintiff's Exhibit 653). The cost of plant for producing 60,000 pounds of NH3 in 24 hours, built under normal conditions, we estimate to be $2,400,000. Of this $2,400,000, it is estimated that the H-N mixture plant will cost $1,600,000, and the ammonia plant proper $800,000. When this plant is operating under normal conditions, the manufacturing cost of H-N mixture and conversion and liquefication costs of the NH3 will be as follows," giving the figures.

MR. ANDERSON: That is all right, if you want to argue it.

MR. KRESEL: I am not arguing it.

RDQ. 432. When you testified yesterday that you based your estimate of four cents a pound as contained in your report to the War Department, was it upon the estimate contained in that letter?

A. So far as the General Chemical Company process was concerned, yes.

RDQ. 433. Colonel Anderson read to you yesterday from page 2601 of volume 3 of Hearings before sub-committee on expenditures of the War Department, where you remember he directed your attention to a report made by a British Commission. You remember that? At page 2601 you said, "I have one of those reports and I think Colonel Joyes has one."

A. I know what you refer to, yes.

RDQ. 434. That was a report that gave an estimate of costs, was it not?

A. Yes.

RDQ. 435. Colonel Anderson did not read the following question to you, which immediately follows the one he did read, and I will read it to you now:

> "DR. PARSONS: I have made calculations and estimates myself which have been in the hands of other people, but I should prefer that you would use those published estimates which I think are essentially correct, although on the pre-war basis, but being on a pre-war basis for all processes, they are comparable although they should be increased if you are going to use them at the present time."

Did you give that testimony?

A. I did.

RDQ. 436. And was that true?

A. Correct.

RDQ. 437. And then the very next question put to you by Mr. Graham, referring to your report to the War Department.

> "In your first report after your trip to Europe, did you advise in favor of the Haber process?
>
> "DR. PARSONS: I did, yes.
>
> "MR. GRAHAM: At that time, was it possible for us to begin manufacture by that process in this country?
>
> "DR. PARSONS: No, sir.

And then you went on in the same paragraph:

> "I should modify perhaps what I said. I was told to report not on a war program, as it afterwards developed. My report was based on an estimated need of the War Department of 180,000 tons of nitric acid per year, which is definitely stated in my report. That is a very small amount as compared with that which they thought after-

wards they would require. They could easily have obtained that amount from material which they had in this country by oxidizing ammonia."

I want to stop there. Were there methods known in this country for oxidizing ammonia quite apart from any Haber patents?

A. There were.

RDQ. 438. In 1919?

A. Yes.

RDQ. 439. And at the time you made your report in 1917?

A. Yes.

RDQ. 440. I continue reading from this paragraph.

THE COURT: Have you much more?

MR. KRESEL: No, your Honor, I will just finish this paragraph.

RDQ. 440. (continuing):

"MR. GRAHAM: Was plant No. 1 at Sheffield a modification of the Haber process?

"DR. PARSONS: Yes, it was the General Chemical Company's process, which uses the same chemical reactions, but uses lower temperatures and which does not come under the Haber patents?"

Did you so testify?

A. I did.

MR. ANDERSON: Of course, this is being taken subject to the same objection.

THE COURT: It is all subject to objection, but I am not just sure that I understand the objection that you have in mind.

MR. ANDERSON: He is reading a matter now to this witness that he testified before, and ask-

ing him if he so testified—his own witness. He can ask his own witness about things; but I do not think he can read from testimony given at a former time and say, "Did you so testify?"

THE COURT: We have been over that.

MR. ANDERSON: That is what I meant.

THE COURT: Yes, I did not understand you. I think that objection is not well taken because this is offered as a connected portion of testimony already in.

MR. KRESEL: I have one more question to read from the hearings before the Sub-Committee of the House Committee on Appropriations of 1922, from which the witness was questioned.

RDQ. 441. I read the following question and answer at page 191:

"THE CHAIRMAN: If I recall correctly the statement of the Secretary of War when he appeared before the Sundry Civil Sub-Committee, it was to the effect that the Haber process plant at Sheffield was not an exact duplicate of the plant constructed in Germany, but there were some modifications.

"DOCTOR PARSONS: It not only is not a duplicate, but it has, except in general principles, very few similarities. It is run at less than one-half the pressure and they use a different catalyst which is the basis of the process. They do many things to work it."

Did you so testify?

A. I did.

MR. KRESEL: That is all.

MR. ANDERSON: Subject to the reservations stated, you may stand aside.

MR. KRESEL: That is all, Doctor Parsons.

(Witness excused.)

CHARLES L. PARSONS resumes the stand.

MR. KRESEL: I understand it is up to the Government to say now whether they want to go ahead with this witness, or whether they want to go before a Master.

MR. ANDERSON: Your Honor stated this morning that the determination as to these patents would only be taken before a Master, and that you would give us till 1 o'clock to consider whether we would go before a Master, as I understood it. My associates and myself have decided that in the present state of the record we do not not care to follow that before a Master.

THE COURT: Then you have no further questions?

MR. ANDERSON: No, sir. I covered as far as I could the questions I thought I could cover before the Court under that ruling.

THE COURT: (To Witness) That is all.

THE WITNESS: Your Honor, before leaving the chair, however, I do not feel that the whole truth regarding my testimony has been put before you, and I took oath that I would tell the truth, the whole truth, and nothing but the truth, and I should like to add this statement. (Showing paper.)

THE COURT: Will you submit it to counsel?

MR. KRESEL: What is it? Let me see it. (Witness hands paper to Mr. Kresel.)

MR. ANDERSON: I am compelled, sir, to object to the addition of this testimony, which is nothing but an effort to explain the evidence.

THE COURT: I do not know what the statement is, of course.

By Mr. Kresel:

RDQ. 442. Doctor Parsons, do you desire to add anything to your testimony?

A. I do.

RDQ. 443. Please go ahead.

Mr. Anderson: I object, sir. If a specific question were asked, I could make an objection; but I do object to a witness being put on after full examination, direct, cross, and re-direct, and to his then being asked what he wishes to say. That will open the door to a speech.

The Court: What have you to suggest when a witness says that he feels he has not told the whole truth and that he wants to do so?

Mr. Anderson: It is for counsel who put the witness on the stand to ask him specific questions; but I do not think that opens the door for the witness to make any kind of statement on the record he sees fit.

The Court: No, it does not; but whether that statement must not be determined after he makes it rather than before is the question now confronting me.

Mr. Anderson: Yes, sir, and if there are any specific questions asked, to the end that I may reserve any rights I may have, if I am so advised, and in addition have the right of cross-examination, should that occasion arise—of course, that is in the discretion of the Court.

The Court: Yes, you would have that right. Then Mr. Kresel,—

Mr. Kresel: I can frame a question, your Honor, I think, that would be unobjectionable.

The Court: I was going to make this suggestion. You have heard the witness's statement, and the witness has handed to you and to counsel for the plaintiff a paper containing that statement.

I ask you to propound to the witness such questions as will tend to elicit the facts therein stated.

MR. KRESEL: Yes, your Honor.

THE COURT: Rather than a general question. So that Colonel Anderson may have an opportunity to object to those questions if he so desires.

RDQ. 442. Dr. Parsons, in the statements made by you before the Congressional committees, from which extracts were read to you, I have noticed that you used the words "Haber Process" indiscriminately when you talked about the German Haber Process, when you talked about the General Chemical Haber Process, when you talked about the Claude Haber Process or the Claude synthetic process. Even I get confused about "Haber." I want you now to state to the Court what the fact is as to the use by you of the words "Haber Process?"

MR. ANDERSON: If your Honor please, I have to make an objection, because of the fact that the use of "the Haber Process" by the witness at various times is taken in connection with the context and must be construed by the Court in the light of that context. To allow him now to undertake to change all his testimony by defining the "Haber Process" in a different way than the context indicates, would in my judgment not be proper. I do not think the question correctly states the evidence on that subject, and I think it would be very difficult to do it.

MR. KRESEL: I am not asking the witness to change any testimony.

THE WITNESS: I have no desire to change any testimony.

MR. KRESEL: Will you answer the question?

THE COURT: Just a moment. Read the question to me. (RDQ. 179 read as recorded above.)

I think Colonel Anderson's objection is well taken to the question as put. I think, however, it

will be proper to elicit from this witness the fact that was elicited from Professor White, namely, as to whether or not the words "Haber Process" are sometimes used generically as well as specifically.

MR. KRESEL: Yes. I thank your Honor.

THE COURT: If that be the fact. I do not know whether it is a fact or not except as it has been testified here.

MR. KRESEL: Before I put that question please permit me to put this one:

RDQ. 443. Doctor Parsons, I read to you from page 1109 of the Hearings before the Committee on Military Affairs of the House of Representatives, which is a portion of your statement made before that Committee in March, 1922, and which was read to you in part yesterday by Colonel Anderson. I read only two sentences. Speaking of the General Chemical Company, you said:

> "The General Chemical Company, in order to be free from the German patents, devised a process which worked at a pressure of 1500 pounds per square inch. In France Claude had devised a process which works at pressures greater than 300 atmospheres. He is working on a comparatively small scale, but successfully, in France. Otherwise those processes are much alike and they are often spoken of in the general term as the Haber process."

Do you remember making that statement?

A. I do.

RDQ. 444. Is that what you want to say here now?

A. That is essentially what I want to say.

MR. KRESEL: That is all.

THE COURT: Any re-cross examination?

MR. ANDERSON: No, sir.

(Witness excused)

ALFRED H. WHITE.

ALFRED H. WHITE, called as a witness in behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. What is your residence?

A. Ann Arbor, Michigan.

Q. 2. And your profession?

A. Chemical Engineer; Professor of Chemical Engineering at the University of Michigan.

Q. 3. How long have you been professor in Ann Arbor?

A. I started teaching at the University twenty-five years ago and have been promoted successively from instructor to—I have been Professor about ten years.

Q. 4. During the late war were you connected with the War Department?

A. I was on leave of absence from the University for two years and entered the Army, being called to active service as Captain on June 4, 1917, and remaining in active service until July 1, 1919.

Q. 5. And what positions did you hold during the war?

A. I was assigned at once to the office of the Chief of Ordnance in Washington, and after a very few weeks of preliminary duty was assigned to the Nitrogen-fixation work, and on the organization of the Nitrate Division was definitely assigned to it and remained there throughout the balance of the period till July 1, 1919.

Q. 6. When was the Nitrate Division organized?

A. The Nitrate Division was organized in late June or early July of 1917.

Q. 7. And was that a branch of the War Department?

A. It was.

Q. 8. Will you give the names of the officers who were members of that Division?

A. The Chief of the Division was Colonel J. W. Joyes, of the regular Army.

Q. 9. May I stop you there a minute? You were in Court yesterday morning?

A. Yes, sir.

Q. 10. And did you hear me introduce a statement or report made by Colonel Joyes?

A. Yes, sir.

Q. 11. Is that the same gentleman that you are now speaking about?

A. The same gentleman, yes, sir.

Q. 12. Very well. Will you proceed?

A. The Division grew to fairly large proportions. We had, I think, well over 100 officers.

Q. 13. I shall not ask you to stop to give the names of all; but Colonel Joyes was in command, was he?

A. Until he was relieved to go to Europe in, perhaps, May of 1919.

Q. 14. What was your particular position in that Division?

A. I was the first officer to report to that Division as the technical assistant to Colonel Joyes, and as the Division grew I was assigned as Chief of the Research Technical Section, which had charge of all investigations of processes of nitrogen-fixation, which advised upon the processes to be used in new plants, and which in general followed the processes as operated in the plants.

In addition to that, I had executive duties from time to time as ranking in the Division next to Colonel Joyes, and acting for him when he was away, and when

Colonel Joyes was relieved to go to Europe I was formally named Associate Chief of the Division.

I may add that I entered as Captain of the Ordnance Department in 1919, became Lieutenant-Colonel in January of 1918, and retained that rank until discharged.

Q. 15. Professor, in your academic work at the University is the subject of fixation of nitrogen one of the subjects on which you lecture?

A. Yes, sir. I have treated that among other subjects—oh, probably for fifteen years.

Q. 16. And I assume that you have studied the problem and the literature connected with it?

A. Yes, sir; I have always tried to keep in touch with that.

Q. 17. Professor, I shall not stop to ask you to describe the different methods of fixation of nitrogen, except the direct synthetic ammonia process, and if you will, I will ask you to describe that as briefly as possible.

A. I have had occasion to describe these processes before various Congressional committees, and to put it in rather brief form and if permitted, I would like to rather follow what I have followed on previous occasions.

The synthetic ammonia process was first devised by the Germans, with Professor Haber as the leading spirit, about 1909, and it was worked out on a commercial scale first in 1913.

The process is relatively simple in theory, but it is extraordinarily difficult from the engineering standpoint; so that it has been said, and I think rightly, to be the most difficult chemical engineering operation ever carried through to success. The process may be outlined as follows:

It is necessary to make a mixture of nitrogen and hydrogen, and these gases must be pure, or at

least freed from certain impurities which frequently occur, and which are so poisonous that even hundredths of one per cent are very detrimental.

When these gases have been purified, they are heated, compressed to high pressure, and brought into combination by a mysterious catalyst which at best can only convert a rather small fraction of the total gases to ammonia.

Then this ammonia, so formed, must be removed and recovered. There are two common sources of hydrogen—the electrolytic, and the hydrogen which is formed in steam. Either of these processes may be used.

In the German process they started with steam, converted that into water-gas, by a well-known commercial reaction, took this water-gas, treated it with a large excess of steam and a lower temperature in a catalyst, and converted a good deal of that carbon monoxide to carbon dioxide and hydrogen. Passed it through an elaborate purifying train, still under pressure, and obtained the pure gases.

The difficulty in the synthesis of ammonia comes to a considerable degree from the difficulty with which nitrogen and hydrogen are made to combine. They do it only under pressure, and at the higher temperature, and it can only be carried out commercially with the aid of one of these catalysts which are kept so secret. But the whole train of procedure is extremely complicated. It is like a watch in one way. It is almost as delicate as a watch, and if there is an interruption at any one stage in the process, the whole work stops.

It is a dangerous operation because we are dealing with combustible gases at red heat and at high pressure, and if there is a leak, there is certain to be a fire, with high-pressure gases flaming out. It is a process which attacked the inventive resources of the Germans, backed by Government supervision,

backed by Government aid, for the period of four years, from 1909 to 1913, before they achieved what they thought was commercial success; and I think it is more than a coincidence that Germany did not inaugurate the World War until about a year after they announced the successful development of this process.

Q. 18. Professor, when you appeared before the Committee on Agriculture and Forestry of the United States Senate, were you still in the war service?

A. I had resigned my commission, but was still employed by the War Department as consulting engineer, with occasional service.

Q. 19. At whose request did you appear and testify before this Committee?

A. I appeared at the request of the Chief of Ordnance.

Q. 20. Before the Committee you introduced as a portion of your statement or testimony four tables with reference to the world's production of fixed inorganic nitrogen, production of atmospheric fixed nitrogen, arrangement thereof by countries, showing the position of the United States in that list, and the domestic sources of inorganic fixed nitrogen. Are those tables correct?

A. Yes, sir, as of that date.

Q. 21. Of course, as of those dates. In one of the tables, Table IV, for instance, you arrange the production of atmospheric nitrogen according to the processes used, the Arc process, the Cyanamid process and the Haber process.

A. Yes, sir.

MR. KRESEL: I am going to ask your Honor to permit me to introduce those statements. They are not very long. There are just a few figures in each; and instead of marking those in the book, I will ask to have them copied as a portion of the witness's testimony.

MR. ANDERSON: No objection, sir, except my general objection to statements of that kind on yesterday, which I reserve.

MR. KRESEL: I will indicate them to the Stenographer as being Table I on page 41 of this volume of Hearing before the Committee on Agriculture and Forestry on S. 3390; Table II on page 41; Table III on page 43; and Table IV on page 43.

TABLE I—WORLD'S PRODUCTION OF FIXED INORGANIC NITROGEN

(Expressed in metric tons of nitrogen)

	1909	1913	1917	1920
Chilean nitrate	300,000	390,000	392,000	500,000
By-product ammonia	212,000	343,000	364,000	410,000
Atmospheric nitrogen:				
Cyanamid process	2,500	60,000	200,000	325,000
Arc and miscellaneous process	3,000	18,000	30,000	32,500
Haber process	.....	7,000	110,000	308,000
Total	517,500	818,000	1,096,000	1,575,000

TABLE II—WORLD'S PRODUCTION OF ATMOSPHERIC FIXED NITROGEN

(In metric tons of nitrogen)

Process	1909	1913	1917	1920*
Arc and miscellaneous	3,000	18,000	30,000	33,600
Cyanamid	2,500	60,000	200,000	325,000
Haber	.....	7,000	110,000	308,000
Total	5,500	85,000	340,000	666,600

*Estimated maximum possible production.

Details of the world's present installations and their present maximum capacity are given in Table III.

TABLE III

Country	Number of plants	Process	Estimated maximum capacity metric tons nitrogen
Germany	2	Haber	300,000
United States	1	do	8,000
Total	3		308,000
Germany	7	Cyanamid	120,000
Austria	2	do	22,000
France	9	do	58,000
Norway and Sweden	3	do	28,000
Italy	5	do	18,000
Switzerland	3	do	7,000
Canada	1	do	12,000
Japan	4	do	20,000
United States	1	do	40,000
Total	35		325,000
France	2	Arc and Miscellaneous	1,300
Norway and Sweden	2	do	30,000
Italy	2	do	1,200
Canada	1	do	800
United States	1	do	300
Total	8		33,600

TABLE IV—DOMESTIC SOURCES OF INORGANIC FIXED NITROGEN (MAXIMUM) IN 1920

(Expressed in metric tons of nitrogen)

Country	Population from atlas	By-products from coal	—Atmospheric Nitrogen— Arc	Cyanamid	Haber	Total	Tons nitrogen per million population
Germany	65,000,000	150,000	.....	300,000	300,000	570,000	8,760
Norway and Sweden.	8,000,000	.....	30,000	28,000	.....	58,000	7,250
Great Britain	45,000,000	100,000	.....	.....	.....	100,000	2,240
Canada	7,200,000	3,000	800	12,000	.....	15,800	2,200
France	40,000,000	15,000	1,300	58,000	.....	74,300	1,850
Switzerland	3,800,000	.....	.....	7,000	.....	7,000	1,840
United States	103,500,000	105,000	300	40,000	8,000	153,300	1,480
Austria	51,000,000	10,000	.....	22,000	.....	32,000	630
Italy	35,000,000	3,000	1,200	18,000	.....	22,200	630
Other countries	.....	27,000	.....	20,000	.....	47,000	...
Total	.....	413,000	33,600	325,000	308,000	1,079,600	.....

Q. 22. Besides the synthetic ammonia process, there was the cyanamid process?

A. Yes, sir.

Q. 23. Before our entry into the war was the cyanamid process one that had been known to work successfully?

A. Yes, it was much better known, much better developed than the synthetic ammonia process.

Q. 24. During the war did you have occasion to observe the operation of the General Chemical Company's process for synthetic nitrogen?

A. Yes, sir, the order to construct Nitrate Plant No. 1 was a definite order given to our Division and we proceeded to execute it. One of the early steps was to visit the experimental plant of the General Chemical Company at Laurel Hill, Long Island, New York, and see just what studies they had made and what attainment they had reached in the development of their process. This was done, I think, in August of 1917.

Q. 25. Who else accompanied you, if anyone?

A. Colonel Joyes and myself were the only two who went on that occasion.

Q. 26. By the way, may I inquire whether Colonel Joyes is still alive?

A. Colonel Joyes is still in the Regular Army service, yes, sir.

Q. 27. And do you know where he is stationed?

A. I think he is stationed at Governor's Island.

Q. 28. New York?

A. New York, yes.

Q. 29. You may proceed.

A. I was convinced that the process would be an extremely difficult one to transfer to a plant scale.

Q. 30. You mean after observing the experimental station?

A. After observing the experimental station—be-

cause of its complexity, and with the consent of the General Chemical Company we arranged to recruit a staff of younger men, chemists and chemical engineers, who should be stationed at the Laurel Hill Experimental Station and be trained in the operation of that process.

Q. 31. You mean younger men connected with the Army?

A. Younger officers, yes, sir. They were all commissioned as officers, assigned to the Laurel Hill plant, for the study of the process, and to be trained and to act as superintendents in the operation of the plant. That came under my general direction, and I received regular reports from that group of officers.

Q. 32. Do you remember when the building of Plant No. 1 at Sheffield, Alabama, was started?

A. I think it was about September of 1917.

Q. 33. And do you remember about when an attempt was made to produce?

A. The initial operation of that plant started in July of 1918, starting with the producer-gas plant, and I think that it was not till September of 1918 that it really had been worked through to the final synthetic stage and started to produce ammonia.

Q. 34. Did it?

A. It produced small amounts.

Q. 35. How much?

A. Well, it was in operation about five months after that time, and my recollection is that it produced in the five months about what it was scheduled to produce—from the first unit only; the first unit only was in operation—in that five months produced what it was scheduled to produce in about three days.

Q. 36. And when was it finally shut down, do you remember?

A. In January of 1919.

Q. 37. After your visit to the Laurel Hill Station,

Long Island, when you say you became convinced that there would be difficulty in transferring it into a large process, what was done with reference to additional plants for the production of nitrogen?

A. It was, I think, in September, 1917, that our Division was advised by the Explosives Division of the Ordnance Department that there was call for a much larger amount of fixed nitrogen than Plant No. 1 could supply, even if Plant No. 1 could operate.

Q. 38. And then what was the next step?

A. I was convinced in my own mind that we could not rely upon the process used in Plant 1 as being one that could be developed during the probable length of the war, and would be a certain reliance. Therefore, I recommended that the Government proceed to erect a plant by the cyanamid process.

Q. 39. And was that recommendation followed?

A. Yes. There were a good many conferences, of course, but it was followed.

Q. 40. And was there a plant built?

A. That resulted in the construction of United States Nitrate Plant No. 2 at Muscle Shoals.

Q. 41. Was that plant successful?

A. That plant was very successful—well-designed.

Q. 42. During the war did the Government undertake to build other plants for the fixation of nitrogen, besides No. 2?

A. Yes, sir. In about December, 1919, I think, they advised us that we should provide another source of fixed nitrogen equal in capacity to the Muscle Shoals plant, and again I recommended the cyanamid process, and again that was adopted. On account of difficulties in providing the large electrical power units, there was considerable delay in the location of the next plant, and it was finally split and half was put at Toledo, Ohio, and part at Cincinnati, Ohio.

Q. 43. But both of them under the cyanamid process?

A. Both of them under the cyanamid process.

Q. 44. In February, March, and April, 1919, was there any plant in the United States that was operating and producing ammonia by the synthetic process?

A. Not that I know of.

Q. 45. Are you familiar with the so-called Haber patents that were introduced in evidence here yesterday?

A. Yes, sir.

Q. 46. You have read them?

A. Yes, sir.

Q. 47. You have studied them?

A. Yes, sir.

Q. 48. During the war in the performance of your duties did you have occasion to refer to them and to study them?

A. Yes, sir; some of them, anyway, because feeling as I did, that the process of the General Chemical Company was not well enough developed to be a certain reliance, I felt it necessary to supplement the knowledge of the General Chemical Company's staff with any information we could get from other sources. The patents of the Germans were, of course, open to us. We had also access to the confidential files of the Patent Office with regard to applications pending; and while I cannot say that I ever studied all of those patents at that time, we certainly tried to get all information we could out of them.

Q. 49. These German Haber patents do undertake to describe the process for the production of ammonia synthetically, do they not?

A. Yes, my only hesitation in saying "Yes" unqualifiedly is that they only describe certain portions—each one only describes a certain portion of the proc-

ess, and the things which are of common scientific knowledge are, of course, not covered by patents.

Q. 50. Professor, if these patents, these pieces of paper, were available to the Government, as you say, during the war, and to others, why is it that the German method of producing ammonia synthetically, which in so far as has been shown was successful in Germany, was not adopted here?

A. We lacked what we usually call the know-how of the process, and we lacked the engineering details.

Q. 51. Won't you please, with the Court's permission, enlarge somewhat on that? Just what do you mean by saying that you lacked the know-how, and what was the engineering information that you lacked?

A. Of course, a patent is not really an invention. It is merely the title to an invention. And although a patent makes considerable disclosure, it does not tell the whole story.

If I may illustrate by something else of more general knowledge to us all: Let us assume that the gasoline automobile was developed in Germany secretly; that in this country no one had ever seen an automobile; that the only information which we knew of the automobile came from a series of patents, which I may enumerate as something of this sort:

A carburetor; a device for mixing gasoline and air in explosive proportions, illustrated by a line drawing; an engine, consisting of a number of internal combustion cylinders connected to a single crankshaft, again illustrated by a simple line drawing; a system of gears for changing the rate of speed of the engine shaft to the main driving shaft, again with a simple sketch; a clutch, and so forth.

Now, all our information is contained in those patents; and now, in an emergency we are asked to pro-

duce on rather short notice a modern automobile. That gives some idea to my mind of the difference between a system of patents and the complete knowledge required to convert those patents into a working operation.

Q. 52. You spoke of lack of engineering knowledge. What was that?

A. These processes for the direct synthesis of ammonia are all alike, in that they use temperatures which are either a dull red heat or nearly a red heat, and use pressures which are high, that is, I do not think any of them work under ten times the pressure of an ordinary steam boiler, and some of them work at pressures of over a hundred times that of an ordinary steam boiler.

When making equipment to handle these gases, it is necessary to use very great care to prevent leaks and we find that many metals deteriorate under the action of these gases and corrode or become brittle and break. The volume of gases is really very large, and the plant is a tremendously complicated thing.

Q. 53. When you speak of the volume of gas; could you illustrate it?

A. If we are to make one ton of ammonia, we have to start with—

Q. 54. You mean by the synthetic process; that is what you are now talking about?

A. By the synthetic process, yes—by this direct synthetic process—we must start with about 100,000 cubic feet of nitrogen and hydrogen.

Now, perhaps that does not mean so much to the audience, but if I can assume that this room is twenty feet high and thirty feet wide and forty feet long, I have a cubic capacity of about 24,000 feet, and it would mean that to make one ton of ammonia by this process it would be necessary to have four such rooms filled

with gas. This gas would have to be compressed to a pressure of certainly over 1,000 pounds, to the square inch, and it would have to be purified in part while under that pressure; it would have to be heated to dull redness, and passed through several different chambers under this temperature and pressure; and after coming out of this system, even with a pretty good catalyst, it would not carry much over five per cent ammonia, and that would mean that something like ten per cent of the total gas had been converted.

In order to recover this ammonia, it is necessary to cool this gas and remove the ammonia by chilling or by scrubbing with water, and then it is necessary to take the balance of the gas, in the plants of the German operators, anyway, and bring it round again, heat it up to redness again, and although they add more gas each time in effect, in order to get that ton of ammonia you would have to circulate this gas ten times through the system in order to get the one ton of ammonia, heating it up to a red heat each time and then by the German process cooling down to a temperature—well, of about 30 degrees below zero Fahrenheit each time.

Q. 55. Professor, I am going to ask you if you will describe the machinery that is used in this process.

THE COURT: Before doing that, we will take the five-minute intermission.

(Whereupon a short recess was taken by direction of the Court.)

(Q. 55 repeated as above recorded.)

A. The process of manufacture of synthetic ammonia, as described, as used in the German plant, started with water-gas by a process which is well known and standard and easily obtained.

The first stage of the process of purification was at first not under pressure, but called for treatment of this gas with really a very large amount of steam,

which added materially to the expense and difficulty, and the gases passed over a special catalyst, which is not so difficult or mysterious, and at carefully controlled temperatures, and to prevent the temperature from dropping it was either necessary to use heat-regenerators or to introduce some air for combustion into this process, or to do both, and the temperature had to be carefully controlled, and these cylinders were probably five or six feet—four feet in diameter, and twelve or fourteen feet high, each of them, and a single unit would have perhaps seven or eight of those in series, gases passing through them all.

In this process the gases coming out of this purification process would have a good deal of carbon dioxide, which now must be removed, and to do that the gases were compressed to a pressure of about 1400 pounds and cooled, and then passed through a tower which in the German plant, according to my recollection, according to the descriptions furnished by the German plants, was perhaps about forty feet high, and the water dissolved out a good deal of this carbon dioxide, and when it came out it was a sort of soda-water physically, and the gases were then not pure enough; and then they were passed through a solution of caustic soda which worked at a temperature of, I think, about 250 degrees Centigrade.

It was not under pressure and it was a strong solution, and any leak in the apparatus under that pressure would not only shoot combustible gas out, but also very caustic liquid; and that would take out most of the carbon monoxide and all of the carbon dioxide.

Then the gas, according to the German process, would be cooled and would be passed through what we usually call copper scrubbers, where there was a copper solution circulated, and that had to be cold, and

these were again large vessels of about the size we have discussed, and the gases still under pressure, and it may have been raised during this period from 1400 pounds to 3,000 pounds.

Then the gases still were—well, they ought to have been pretty nearly purified enough by this time; but depending on the catalyst used, it might have been necessary to dry them, absolutely, completely; and under those circumstances they would pass through another train of equipment, still under pressure, to dry the gases.

Then they would be heated, and in order to economize heat they were passed through heat-interchangers, and since these vessels were running at a red heat, and steel is made weak and embrittled by these gases, and so explosions are liable to result, these vessels had to be made especially strong.

Then the gases coming out were passed through a refrigerating system—I am speaking still of the German plants—and in this refrigerating system, the ammonia was liquefied, and most of it was separated in the liquid form, and then the gases were passed back through a circulating pump back into the pure gases before they entered the regenerator; and so the system went round and round.

Q. 56. Was there more than one catalyst used in the process?

A. There were two distinct types of catalyst. In the purification of hydrogen there is one type of catalyst, and in the synthesis of ammonia there is a distinctly different type of catalyst.

Q. 57. Were there among these German patents, patents covering catalysts?

A. Yes, sir.

Q. 58. Will you tell us something about the description in the patents with reference to catalysts?

A. There are a number of different patents referring to catalysts and there are a large variety of things claimed as acting as catalysts. In the ammonia synthesis there are, I think, something like fifty different chemical elements specified as acting in one way or another catalytically.

Q. 59. Professor White, during the early part of 1919 and for a year prior thereto, and since that time, have you kept yourself informed of the market price for ammonia in the United States?

A. Yes, sir, to a reasonable degree.

Q. 60. And could you give us the average per pound at which ammonia was selling in the United States?

A. During what period?

Q. 61. 1919 and, say, today?

A. There was a very inflated period right there at the close of the war, but when the drop came after the war ammonia fell to about ten cents a pound and has run along somewhere near there since.

Q. 62. What is sulphate of ammonia?

A. Sulphate of ammonia is a salt made by combining ammonia with sulphuric acid, and is the material which is very largely used in fertilizer.

Q. 63. What has been the average price of sulphate of ammonia within the past four or five years?

A. Let us see. It is running now about $75 a ton and—oh, $65 to $75.

Q. 64. And per pound it would be about what?

A. That is three to three and a quarter cents.

Q. 65. Per pound?

A. Per pound; yes, sir.

Q. 66. Have you had occasion to see the summarized costs per ton of ammonia, of a one hundred atmosphere plant, as shown at page 128 of Defendant's Exhibit 140, the result being that the cost per pound

from water gas hydrogen by the synthetic process would be eleven cents or a little over, per pound?

A. Yes, sir.

Q. 67. And from the electrolytic hydrogen it would be 10.7 cents per pound?

A. Yes.

Q. 68. I call your attention to this calculation or summary of costs. The second item there is investment per annual ton of $500. Do you find there any allowance made for working capital or starting-up expense?

MR. ANDERSON: May I ask, if your Honor please, the purpose of counsel?

MR. KRESEL: Yes.

MR. ANDERSON: Is it to attack their own statement that they introduce in evidence?

MR. KRESEL: No, certainly not. I would not undertake to attack this official document.

THE COURT: What is the specific objection, Colonel Anderson—or what is the particular purpose, first, Mr. Kresel?

MR. KRESEL: Your Honor, the calculation made by the Government resulting in this eleven cents a pound does not take into consideration any allowance for capital or starting-up expense. The question that I am putting to this witness is going to be based on that additional allowance, and I am simply calling attention to the fact.

THE COURT: And you are going to ask him in a question hereafter to be put, to predicate his opinion upon—

MR. KRESEL: An additional element in addition to what is contained in the report. I am not contradicting the report in the slightest.

MR. ANDERSON: In the second place, I state the report speaks for itself; if it does not contain

working capital, it does not contain working capital; if it does, it does. Again, it is not a report prepared by the Government, but is a report prepared by Mr. Norton.

MR. KRESEL: By whom?

MR. ANDERSON: Mr. Norton, I think, isn't it?

MR. KRESEL: Not at all. This is the report made by the Nitrate Division, Ordnance Office, War Department, assisted by the Fixed Nitrogen Research Laboratory, Department of Agriculture.

THE COURT: I think the question is an ultimate question, and probably might not be valid, but inasmuch as it is merely inducement to a subsequent question I think it may be put and the answer taken.

A. If I remember the question, the answer is no working capital is included in that estimate.

Q. 69. Professor, this $500 investment in the summarized costs, given in this volume, is per annual ton. I am going to ask you to assume that a plant to produce 10,000 tons of ammonia was being considered. Then we would start with an investment of $5,000,000 according to these figures.

A. That is right.

Q. 70. In putting up such a plant what would be the requirement for working capital and starting up expenses, approximately?

A. I should put it at about another million; about 20 per cent of the other.

Q. 71. What would be a minimum of fair return on an investment in this sort of a project; I mean by percentage?

A. I don't believe that any commercial manufacturer would go into any operation that he could not get at least ten per cent on. Most of them would want fifteen, on account of the commercial uncertainties.

Q. 72. Let us take ten per cent, then. On an investment, then, of $6,000,000 there would be a ten per cent profit, or $600,000?

A. $600,000; yes sir.

Q. 73. And assuming a plant which produced 10,000 tons of ammonia, that would be how much per ton?

A. That is $60 per ton of ammonia, or three cents per pound.

Q. 74. So that if you assume someone going into the manufacture of synthetic ammonia by the process described here, upon the figures given by the Government in this publication, eleven cents per pound, if you add thereto a profit of ten per cent for the investment—which is not included here at all, no profit being included—it would bring the cost per pound of ammonia produced to what?

A. 14.1 cents by the water gas process and 13.7 by the electrolytic process.

Q. 75. Professor, I wish you would listen to this question attentively. Basing your answer to this question upon your experience and your knowledge of the development of the art of fixing nitrogen, your knowledge of the U. S. Haber patents which have been put in evidence; the fact that the General Chemical Co. had developed in the United States a new direct synthetic ammonia process under United States letters patent now in evidence; the fact that the Claude direct synthetic ammonia process had been or was being developed in France; the lack of information or the know-how that you have described, showing how the processes covered by the United States Haber patents could be carried out in the United States; the fact that there were other methods of fixing nitrogen such as the arc, the cyanamid and the cyanide processes; the fact that the cost of producing ammonia

by the German Haber process in the United States, according to the statement of Colonel Joyes, would have been approximately 16 1-2 cents per pound in the United States and higher than the cost of production by the cyanamid process; the fact that the cost of producing ammonia by the General Chemical process was according to the report of the Ordnance Department and the Fixed Nitrogen Research Laboratory, at least eleven cents without making any allowance for capital and starting-up expenses, and with no allowance for any profit at all; the fact that the cyanamid method or process was well known and had for a number of years been commercially successful; the fact that the production by the direct synthetic ammonia process would necessarily come into competition in the United States with the production of the cyanamid process and the production from by-product coke ovens and with Chilean nitrates; taking into consideration the lack of skilled personnel to operate under the Haber patents in the United States even if the information as to how the processes described therein could be successfully carried out had been available; the fact that outside of Germany there was no plant anywhere in the world producing ammonia by the direct synthetic ammonia process described in the German patents, and that the only plant that had been built in the United States, to wit., Plant No. 1, at Sheffield, Alabama, using the synthetic ammonia process developed by the General Chemical Company, was not a success—what in your opinion was the value of the Haber patents in the United States in the months of February, March and April, 1919?

MR. ANDERSON: The same objection as to the former question.

THE COURT: You may state your specific objections later in the day.

MR. ANDERSON: Yes, sir. I make the same ob-

jections to that question that I specified to the question this morning.

THE COURT: The same specific objection.

MR. ANDERSON: The same specific objection, in addition to the general objections we are reserving to all this evidence. There was one further point which occurred to me when hearing the question read which has gone from my mind. Anyhow, I will make those same specific objections.

THE COURT: If it occurs to you again you may state it. The question will be answered.

A. They would have what is sometimes called a nuisance value, a guarantee against legal proceedings for infringement under these patents. They might be called a legal lightning rod.

Q. 76. A legal what?

A. A legal lightning rod. But their actual value to a manufacturer contemplating going into the synthetic ammonia business would be nominal and certainly very small.

Q. 77. Would you care to say, with reference to the business man who was contemplating putting millions of dollars into this business, what that nominal value would be?

A. No, I do not believe so. I would have to know just what process he was planning to operate under before giving him any advice.

MR. KRESEL: You may examine.

THE COURT: May I ask two questions before you cross-examine.

MR. ANDERSON: Yes, sir.

THE COURT: Do I understand the cyanamid process is not involved in the 58 Haber patents here in issue?

MR. KRESEL: Not at all, sir.

THE COURT: Do I understand you that Plant No. 1 at Sheffield, Alabama was a synthetic process within or without the 58 Haber patents?

MR. KRESEL: Without the Haber patents. It was under the General Chemical process.

THE COURT: And do I understand it is your contention that that plant was a success or a failure?

MR. KRESEL: A failure, according to the official statement.

THE COURT: Is it your contention that the process involved in the Plant No. 1 at Sheffield, Alabama was a better process—I do not use the word "improved" process, but a better process —than the German process, the German-Haber process.

MR. KRESEL: Well, insofar as I know anything about it, your Honor, I do not understand that the Haber process was sufficiently well understood here for anybody to be able to say which was better.

MR. ANDERSON: Your Honor's questions were directed to counsel for the defendant and not to me?

THE COURT: Yes. I understand your contentions, but I did not understand Mr. Kresel's.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 78. Colonel White, would you define a little more definitely what you mean by nuisance value?

A. I can not attempt to give any legal definition because I am not a lawyer, but my own understanding of that is, as used by engineers and manufacturers that it is a value which adheres to them because they are relieved of some sort of nuisance. If you can avoid

some sort of a nuisance through a certain form of payment or acquirement of a right, you say that has a nuisance value.

THE COURT: You mean insurance against annoyance?

THE WITNESS: Insurance against annoyance, yes, sir, that is better.

XQ. 79. Is it not a fact that a great many patents are purchased by manufacturers in the practice of business that in fact are never used at all?

A. I think so.

XQ. 80. And is it not a fact that they frequently pay very large sums for patents that are in the nature of basic or pioneer patents, to the end that they may use the improvements thereon freely?

A. I believe that is true, too.

XQ. 81. I think you said in your most interesting statement on direct examination that Haber and Bosch, whose patents have been put in evidence here, were the pioneers in this great development of the synthetic process of making ammonia?

A. They are the pioneers in the commercial development, undoubtedly.

XQ. 82. If I recall correctly, Professor White, at some time in your former testimony, to which I will not refer unless necessary, you stated that their achievements in this regard constituted one of the great monuments to their ingenuity and skill?

A. That is right.

XQ. 83. And you so regard it still, do you not?

A. I do still.

XQ. 84. You spoke of the know-how. The idea that I got from your description was that even in the case of your illustration of the automobile, where you had the basic idea set forth in the paper, or the direction to you, it was necessary to have certain expe-

rience in the actual application of the idea to get a commercial result. Is that it?

MR. KRESEL: Not experience. Information.

MR. ANDERSON: Well, now, Mr. Kresel—

MR. KRESEL: But, if your Honor please, I do not think that is quite proper.

MR. ANDERSON: If your Honor please, I think I can examine this witness without the aid of counsel.

MR. KRESEL: You can examine without my aid, but you can not examine him and state a fact which the witness did not say. I do not mean that you purposely did that.

MR. ANDERSON: This is a very able gentleman, and I think if I misstate it he will correct me.

THE COURT: I will have the question read. Is there an objection pressed here—or is there nothing before me?

MR. KRESEL: Your Honor, I object to the question upon the ground that it does not state correctly—and I do not mean any reflection upon Colonel Anderson—the testimony of the witness.

THE COURT: Is the question pressed?

MR. ANDERSON: I will withdraw the question and put it another way.

XQ. 85. Professor White, you did not define the expression "know-how" quite as clearly to me as is necessary for me to get definitely your limitations. Do I understand by that you mean where you had a direction to do a certain thing, a written direction, a certain amount of experience in the application of that direction would be necessary in order to accomplish a manufacturing result in a complicated manufacturing or engineering problem?

A. No, I do not mean that altogether. A certain amount of experience may be necessary, but there

is also involved the inference that an element is lacking in the original directions.

XQ. 86. If you had a complete direction, complete as an idea, as a laboratory idea, involving the complicated mechanical and engineering problems which you have indicated in this process, would you not have to have men of experience in dealing with those problems, to work it commercially?

A. Yes, sir.

XQ. 87. Is it not true that in these chemical and especially complicated organic chemical processes which are patented, the patents are usually gotten out on laboratory experience?

A. I think so.

XQ. 88. And so far as you know the patents, both German and American, which have been put in here, are based on laboratory experience, are they not?

A. Apparently.

XQ. 89. The original patents, in any event, are based on that?

A. The earlier patents, you mean.

XQ. 90. The earlier patents. And is it not your experience as a chemical engineer that the application of information thus developed in laboratory experience, to a larger industrial or commercial problem frequently involves a good many difficulties and modifications from the laboratory results?

A. Usually does.

XQ. 91. It usually does, yes. And the more complicated the chemical and engineering problems involved the greater the proportion of variation from actual laboratory test necessary to make it a commercial proposition on a large scale; is that not true?

A. That is usually correct, yes.

XQ. 92. In your description of the mechanical processes through which these gases were passed, or mechanical and chemical combined, in order to pro-

duce ammonia, I understood you were describing the processes in the German plant?

A. Yes, sir.

XQ. 93. I think you stated that throughout; and on the German Haber-Bosch process, so-called.

A. Yes, sir.

XQ. 94. You have not actually been in any of those plants, have you, Professor?

A. German plants?

XQ. 95. Yes.

A. No, sir.

XQ. 96. Your description was based on the study of these patents and their processes, was it?

A. Not so much on the study of the patents as upon articles which have appeared in the engineering press and things which are now matters of public knowledge.

XQ. 97. Colonel, you practice your profession as a consulting chemical engineer, do you not?

A. Yes, sir.

XQ. 98. Would you mind me asking if you are connected with any of the companies interested in The Chemical Foundation in that capacity? I do not mean to reflect upon your evidence in the slightest in saying that.

A. Not that I know of. Do you mean who have taken licenses under The Chemical Foundation?

XQ. 99. Well, that would be a rather general statement.

A. It would.

XQ. 100. I did not want to ask you to call off the names of your clients, any more than I would ask a lawyer; but you act in a consulting capacity to a number of chemical and dye plants, do you not?

A. Not of any dye plants, but chemical plants.

XQ. 101. The large chemical manufacturers of the country?

A. Yes.

XQ. 102. I think that is all I want to ask you about that. I do not want to ask you to disclose them.

THE COURT: But that will not help.

MR. KRESEL: With that suggestion, your Honor, I do not think it is proper to leave it there. I am going to inquire who they are.

THE COURT: Unless some of those plants are licensees or have become stockholders of the defendant company. That is one thing. But if he leaves it where it is—

MR. ANDERSON: I recognize it.

XQ. 103. Will you please state them, if you do not mind.

A. Just what is your question?

XQ. 104. The companies with which you have been connected or have been with in the last two years——

A. Dealing with nitrogen fixation?

XQ. 104A. No, on any chemical subject.

A. The Air Reduction Company of New York, the Nitrogen Corporation of Providence, Rhode Island, the New York & Pennsylvania Company of New York, the Trust Con. Laboratories of Detroit, the By-Products Chemical Company—I am not sure whether that is a corporation or not—of Wisconsin. That is all at present.

MR. KRESEL: None of whom, your Honor, is either a stockholder or a licensee of our company.

MR. ANDERSON: That will be a question for argument.

MR. KRESEL: How can there be argument on that?

THE COURT: They either are or are not.

MR. ANDERSON: They either are or are not, but I am not going to stop to look at the list of stockholders and underwriters now.

MR. KRESEL: But to make the suggestion to

this witness—I am not attacking your credibility, but tell me whom you are working for——

THE COURT: Do you happen to identify these as stockholders or licensees?

MR. ANDERSON: I have not the slightest idea who the stockholders are and I could not possibly carry it in my mind. There is a list in the record.

THE COURT: Unless you point them out to me hereafter, I shall assume they are not.

MR. ANDERSON: Of course, I cannot imagine, your Honor, that you would take the slightest notice of it unless I brought out some connection between the two. If the record enables me to do it, I will; and if it does not, I won't.

XQ. 105. Colonel White, could you undertake to point out the essential differences, if any, between the so-called Haber-Bosch process of producing synthetic ammonia, covered by the 58 patents in evidence and the so-called General Chemical Process now claimed to be in use by that company? I mean, can you do that?

THE COURT: That calls for a yes or no answer, with modifications, if necessary.

A. Yes, in a general way.

XQ. 106. You can in a general way?

A. Yes.

XQ. 107. Then I will ask you: Do you know just what process is being applied by the General Chemical Company at the present time at Syracuse?

A. No, I have no knowledge of anything since the war; since July of 1919.

XQ. 108. So that your distinction between the two processes would have to be applied, I take it, to the processes used at Nitrate Plant No. L and the Haber-Bosch process?

A. Yes, sir.

XQ. 109. Now I would be interested to have your

line of distinction drawn between the two processes; the essential chemical and engineering differences?

A. Before I answer that question, Colonel Anderson, I would like to state the conditions under which I learned of the General Chemical Company process and ask the Court how far I may use such knowledge.

XQ. 110. You do not have to do that because if you learned it confidentially, I am not going to ask you to do it.

A. My knowledge of the processes of the General Chemical Company was acquired in confidence as an officer of the army.

MR. ANDERSON: Then I withdraw any question of that kind under those circumstances.

MR. KRESEL: You are perfectly willing to give the information?

THE WITNESS: I am perfectly willing to give the information, if I am released from the pledge of secrecy.

MR. KRESEL: The Government can release you.

MR. ANDERSON: I do not think the Government can relieve him if he acquired it from the General Chemical Company.

THE COURT: That is for the Government itself to determine.

MR. ANDERSON: If he acquired it from the General Chemical Company?

MR. KRESEL: Not from the Chemical Company; he did not say that.

THE COURT: I will hear Colonel Anderson, and then I will hear you, Mr. Kresel.

MR. ANDERSON: Yes, I would greatly like to complete my statement. It is my view, sir, that if he as an officer of the Government acquired information from the General Chemical Company under the seal of confidence of his official position,

that the Government itself is bound to observe that confidence unless it is released by somebody very much higher than myself. Therefore, I withdraw the question.

MR. KRESEL: Now then—consistency! They produce here the General Chemical Company's letter, which was given to Dr. Parsons, as a report of the War Department, in the strictest of confidence. That is one thing. When this gentleman says that he has the information which he gained, not from the General Chemical Company, but from Plant No. 1, as an officer of the army, because they know it is going to hurt them, they do not want it and they plead that it was obtained from the General Chemical Company, when the witness has not said any such thing.

THE COURT: There is no question before me.

MR. ANDERSON: If your Honor please, I desire to make just a statement in reply, with your Honor's permission. In the first place, the letter to Dr. Parsons was not marked "Confidential." It was not a confidential communication, but was taken from the general files of the War Department. The substance and the results of the letter and the details in the letter are in an official report introduced by the defendant itself.

In the second place, if I am inconsistent, I am sorry. I recognize I am one of the lowest of the servants of the people in the United States, including counsel himself as a citizen, and shall be sorry to incur his disapproval, but I shall try to stand it in serving the other 110,000,000.

XQ. 111. Now, Doctor, I would like to ask you one other question. As I understand, doctor, Nitrate Plant No. 1 did in fact produce synthetic ammonia?

A. Yes, sir.

XQ. 112. It did not produce enough, in the view

of yourself and other experts of the Government, to make it a commercially successful proposition as then operated or designed, is that true?

A. That is correct.

XQ. 113. I think it appears somewhere in the testimony here that it altogether produced something around 7,500 tons during the period of operation. Do you recall what the amount was?

A. Pounds, I guess; not tons.

XQ. 114. Well, it may have been, doctor. Whatever you say, I accept.

A. I think in five months that plant produced about what it ought to have produced in three days, which would have given it 45,000 pounds or 20 tons—22½ tons.

XQ. 115. And that is about what it did produce, about 45,000 pounds?

A. I think that is it.

XQ. 116. What was the price of synthetic ammonia in March and April, 1919; do you recall?

A. Synthetic ammonia?

XQ. 117. Yes.

A. In this country?

XQ. 118. Yes.

A. There wasn't any.

XQ. 119. What was the price of ammonia? I used the word "synthetic" inadvertently.

A. The ammonia that is ordinarily quoted is the ammonia that is used in the form of sulphate or second grade aqua, and I think that had dropped to nearly 10 cents at that time. I would have to look it up to be sure of the dates.

XQ. 120. You know as a matter of fact that there is a plant being operated on the direct synthetic ammonia process, whatever it is, at Syracuse today?

A. That is the report from all sources; yes, sir.

XQ. 121. Do you know, doctor, how much that plant is producing daily?

A. I am told that that is producing as high as 17 tons a day.

XQ. 122. How much would that be a year, could you tell me?

A. Well, if it operates 300 days a year, that is 5,100 tons. It may run 6,000 or so.

XQ. 123. Was not the cyanamide process also a German invention?

A. Yes, sir; the cyanamide process was first developed in Germany.

XQ. 124. You were examined by counsel on the matter of a statement contained on page 128 of Exhibit 140 introduced by counsel.

A. Yes, I have it here.

XQ. 125. May I call your attention to the last five items of the statement before the grand total and have you read what those items are?

A. It starts, Interest, Depreciation, Amortization, Taxes, etc. Subheadings under those: Buildings, Cells, and Equipment.

XQ. 126. There is also an item of contingencies 10% of the above total, is there not?

A. Yes, sir.

XQ. 127. Doctor, do you know whether those items in there contain the item of working capital and interest?

A. No, I do not think they do. Excuse me, until I look back to the preceding page. What is your question? Do they include working capital?

XQ. 128. Do you know whether the ten per cent contingencies of the item of Interest, Amortization, etc., included the item of working capital?

A. No, sir. In any ordinary engineering job, we figure up the costs as well as we can; and the standard practice is to add 10 per cent for contingencies, mean-

ing sundry things we overlook. That is not working capital.

By THE COURT:

Q. 129. Emergencies?

A. Yes, sir.

Q. 130. A margin of safety?

A. A margin of safety; yes.

By MR. ANDERSON:

XQ. 131. When you included a ten per cent return on the investment, did you not mean to include by that the normal profit of the business?

A. Yes; that is the normal profit of the business.

XQ. 132. Colonel White, do you recall a conference of the patent section, purchase branch of the Purchase, Storage and Traffic Division of the War Department at Washington, held at Mr. Dorr's office in the early part of the spring of 1919?

A. I was at Mr. Dorr's office several times, but I do not know what you refer to.

XQ. 133. I will give you this memorandum, ask you to look at it, and ask if you recall the conference to which that memorandum relates, as you are shown by that memorandum to have been one of those present (handing paper to witness).

A. I see that I am named as one of those present. I never saw this memorandum.

MR. KRESEL: What is the question, please?

MR. ANDERSON: I asked if he could identify the conference, with the memorandum to refresh his recollection, and if he was present.

A. (continuing). I can testify that I was present at at least one conference where the question of the control of patents of The Chemical Foundation was discussed.

XQ. 134. But you can not now say that the memorandum is a correct statement of what took place?

A. Do you want me to study it carefully? I may be able to testify to parts of it.

XQ. 135. Well, I will not want you to identify part unless you could identify all. If it is not a reasonably correct and accurate statement of what took place, I will not ask you about it in the first place?

A. I can not remember enough to know whether it is or not.

MR. KRESEL: May that be marked for identification?

MR. ANDERSON: No, sir. I have not used it at all.

MR. KRESEL: Of course you have used it for this witness and we are entitled to look at it.

THE COURT: You are not entitled to examine a paper marked for identification, but you are entitled to have it marked for identification so that if produced again you may know it is the paper about which the witness testified.

MR. KRESEL: Our rule in New York is a little different; but of course, your Honor's rule is what counts here. May the paper be marked for identification.

THE COURT: With regard to any paper marked for identification, although I have noticed counsel have not been observing the rule, and I have not had occasion to mention it before—but any paper that is identified by the witness may be marked for identification by the opposite party at the request of the party, and the person who introduces it may put the paper back in his pocket if he wants to and make no further reference to it, but the paper may now be marked for identification.

MR. ANDERSON: Whatever your Honor rules here I will only be too glad to comply with. The

witness did not identify the paper, because he had never seen it before.

THE COURT: He testified about that paper, so that he may——

MR. ANDERSON: It is immaterial to me, because I do not want the paper to get out of my possession. It is the only copy I have.

MR. KRESEL: Does the Government decline to show us the paper?

MR. ANDERSON: I do at the present time. Will you mark that for identification, Mr. Clerk?

Marked for identification "Plaintiff's Exhibit A 17/7/23 for Identification."

XQ. 136. Colonel, did you deliver an address before the Chicago Meeting of the American Institute of Chemical Engineers, on January 16, 1919?

A. Yes, sir.

XQ. 136-a. At that time you appeared as Lieutenant-Colonel of the Ordnance Department of the United States Army?

A. Yes, sir.

XQ. 137. Have you a copy of that address?

A. I am sorry I have not; not with me.

XQ. 138. Would you send me a copy?

A. I will send you a copy, certainly.

XQ. 139. I will ask you to identify this, which is taken from the Library of Congress, and borrowed for the purpose. Will you identify that as your address and send me a copy?

A. Yes, that is the one, and I will send you a copy of it, Colonel.

XQ. 139-a. Published in the Journal of Industrial and Engineering Chemistry for March, 1919?

A. Yes.

MR. ANDERSON: May I now introduce that in evidence, with leave to substitute the copy from Colonel White when received?

MR. KRESEL: Upon what theory is any such thing being offered? Is it to contradict this witness?

MR. ANDERSON: It is not offered for the purpose of contradicting this witness, but for the purpose of further explanation of the principles, some of which the witness has outlined, and the processes.

MR. KRESEL: I object to that your Honor. The only purpose for which any prior statement by a witness may be introduced, except if he introduces it himself, is for the purpose of contradiction. You can not make evidence here by what he said somewhere else. You yourself have invoked that rule against me.

THE COURT: Do you challenge the correctness of that, Colonel Anderson?

MR. ANDERSON: Not as a general principle, but for a little further cross-examination.

THE WITNESS: May I add this, Colonel Anderson, that the reprints I think are probably those from the Official Journal of the American Institute of Chemical Engineers, and not from that source. I presume that will be all right.

THE COURT: As I understand, the request is withdrawn now, is it not?

MR. ANDERSON: It is withdrawn unless I can introduce it, so I will have to read such portions as I may to the witness and ask him if that is such portion of his address.

THE COURT: Very well.

XQ. 139-b. At page 236 of the Journal of Industrial and Engineering Chemistry, Volume II, No. 3, for March, 1919, you made this statement in that address, which I will ask you if it is correct:

"The direct synthesis of ammonia from nitrogen and hydrogen was first developed from the

theoretical and practical side in Germany, and the name most frequently associated with that is that of Haber. The combination of nitrogen and hydrogen according to the reaction,

$$3H_2 + N_2 \rightleftharpoons 2NH_3$$

is favored by high pressure and relatively low temperature. Some of the equilibrium values are given in the following table."

Then I will give this to the stenographer and ask him to copy in the table. You remember it, do you not?

A. Yes, sir.

(The table is as follows):

"Per cent. NH_3 in Equilibrium at pressures (in Atmospheres) of

Temp. °C.	1	30	100	200
300	2.18	31.8	52.1	62.8
500	0.129	3.62	10.4	17.6
700	0.0223	0.66	2.14	4.11

XQ. 140. (Reading).

"The rate of reaction between the gases is altogether too slow to be commercial unless accelerated by a catalyst. Our knowledge of catalysts is still very vague, and catalysts are discovered only by tedious experiments, largely empiric in their nature. Furthermore, they are extraordinarily susceptible to poisons.

"While therefore the reaction between nitrogen and hydrogen is extremely simple to write, it is extremely difficult to carry out economically. The successful solution of the problem involves many problems, but they may be divided under the following groups:

"(1) Preparation of pure nitrogen.

"(2) Preparation of pure hydrogen.

"(3) Preparation of catalyst.

"(4) Constructional plant.

"Preparation of Pure Nitrogen.

"It is unfortunate that the term 'fixation of nitrogen' fixes attention so strongly on nitrogen that the lay mind gains the impression that one of the chief difficulties to be overcome is the preparation of the nitrogen. The arc processes start with air, but all the other processes require, or at least work distinctly better if supplied by nitrogen substantially dry and free from oxygen, carbon-dioxide, and carbon monoxide. Argon, helium and other rare gases of the atmosphere interfere only as they dilute the nitrogen slightly. The supply of pure nitrogen is important, but fortunately the liquid-air processes are so cheap and reliable, that the problem may be considered as solved. The nitrogen column as delivered to the United States nitrate plants has an hourly capacity of 20,000 cu. ft. of dry nitrogen, with less than 0.1 per cent oxygen for an expenditure of 180 horsepower hours. Power is by far the most expensive item, for air is free, only a small amount of caustic is needed for the purification of the entering air, and the labor charge is small. The operation is so reliable and the cost so small, that efforts to recover waste nitrogen from industrial sources are hardly worth while where really large installation is being considered.

"Preparation of Pure Hydrogen.

"Pure hydrogen is needed only for the direct synthetic ammonia process. It forms 17.6 per cent of the theoretical gas mixture by weight, but 75 per cent by volume. Hydrogen is formed as a by-product of the electrolytic manufacture of chlorine, but the expense of collecting it and purifying it is considerable. Hydrogen and oxygen are obtained by electrolysis of caustic solutions, but it is difficult to find a location where both gases can be used to advantage. It is also made by the action of steam on red-hot iron and by the water-gas reaction wherein steam reacting with coke produces approximately equal volumes of carbon

monoxide and hydrogen. By further reaction with steam in the presence of a catalyst, as shown by the following equation"——

MR. KRESEL: May I interrupt here if you please? Counsel has now been reading almost ten minutes. No question has been put so far, and what has been read is in no wise contradictory to what this witness has testified; and while Colonel Anderson reads very well, I do not think that we are profiting very much by his standing there and reading.

MR. ANDERSON: I think that the statements made here clear up very materially and avoid the necessity of my going through a cross-examination of Colonel White's very interesting statement this morning, and unless the Court rules that I can not read them and ask him at the proper time if that is a correct statement of the situation and of a matter referred to and used at that time, then I shall ask leave to read them. I am perfectly willing to put those papers in evidence, as they are a most complete discussion of this matter, and there are other phases of it to which I have got to refer. I would very much prefer to put them in evidence and stop right there. It certainly can he said this morning, and only elaborate those not hurt anybody. They are consistent with what points and some other questions about which I would have to examine him to get the information.

MR. KRESEL: Your Honor, that is just as I anticipated. Counsel can not point to a single line or a single word in that statement which is contradictory of what this witness has testified. Now, I do understand that I was correct in my argument, that the only purpose for which it can be introduced is to contradict it. I think Colonel

Anderson should point out now the portions that are contradictory, and then, of course, those will go in; but for us to sit here while Colonel Anderson reads long extracts from this speech, which he says are consistent with what the witness has said, seems to me is a waste of time.

MR. ANDERSON: We spent the entire morning listening to extracts read yesterday from a speech in the record by counsel's own witness, and I repeat what I have said——

THE COURT: There is no need to repeat it.

MR. ANDERSON: This statement is in connection with his own statements read this morning and clarifies certain points I want to clarify.

THE COURT: Then, if the strict rules were to be applied, it would be necessary for you to frame your questions independently of the article so far as matters which you do not offer in contradiction of Professor White's testimony is concerned. If you have embodied in the article statements which you contend are contradictory to his testimony given by Professor White, then they may be introduced apart from the other portions of the article. I will permit you to do that at the beginning of the afternoon session, at one o'clock, Standard Time.

AFTER RECESS.

XQ. 141. Colonel White, you stated this morning that you delivered an address before the American Institute of Chemical Engineers on January 16, 1919, in which you discussed at length the various processes for the fixation of nitrogen, did you not?

A. Yes, sir.

XQ. 142. Did you discuss at that time fully the so-called Haber process?

A. Yes, sir; fairly fully.

XQ. 143. And the other processes which you mentioned in this morning?

A. Yes, sir.

XQ. 144. You discussed at some length also the importance of nitrogen, of fixed nitrogen and ammonia, in the commercial and the military aspects, also, did you not?

A. Yes, sir.

XQ. 145. You there discussed at length the methods then prevailing, of producing this ammonia through nitrogen fixation, as well as the cyanamid and other processes?

A. Yes, sir.

XQ. 146. That article was published at about that time, was it not?

A. Yes, sir.

XQ. 147. You published in February, 1920, in the Chemical and Metallurgical Engineering Journal an article dealing with the demand and supply of fixed inorganic nitrogen in the United States, did you not?

A. Yes, sir.

XQ. 148. In that article did you point out at that time the rapidly increasing uses for ammonia, and the increasing demands?

A. Yes, sir.

XQ. 149. Is it not a fact that the increased use of ammonia for commercial and agricultural purposes, and for explosives, doubles about every ten years? Isn't that about it?

A. The total demand doubles about every ten years for all purposes.

XQ. 150. Is it not a fact, that, carrying out that ratio of increase, the demand in the United States alone would exceed the entire maximum production of the Chilean nitrate supply in a comparatively short time?

A. I think so; yes, sir.

XQ. 151. And it would more than absorb the entire present production from by-product coke ovens?

A. In the United States; yes, sir.

XQ. 152. Is it not a fact that you then estimated if that ratio of increase continued, by 1930 the demands in this country alone would be at least 676,000 short tons?

A. Of nitrogen or ammonia?

XQ. 153. Of nitrogen; and which would make out 3,900,000 long tons of Chilean nitrates; be equal to that?

A. Yes, sir.

XQ. 154. That is a correct statement, is it not?

A. If you quoted the figures I have there, it is.

XQ. 155. Assuming a 7 per cent cumulative increase, making some allowance for a war period, the demand by 1930 would reach as high as 458,000 tons of inorganic nitrogen, equivalent to 2,600,000 tons of nitrate, which is about Chile's maximum production, is it not?

A. Yes, sir.

XQ. 156. The Chilean supply is gradually decreasing, is it not?

A. Yes. There is some difference of opinion on that, but it is decreasing.

XQ. 157. Did you not at that time urge the continued operation of both Government-owned plants?

A. Yes, sir.

XQ. 158. That included Plant No. 1 and Plant No. 2?

A. Yes, sir.

XQ. 159. Colonel, why, you spoke this morning of producing nitrogen or ammonia by the fixation process under present conditions?

A. Yes, sir.

XQ. 160. Did your testimony then relate to the conditions in 1919 or at the present time, do you recall?

A. 1919.

XQ. 161. Did you take into consideration the by-products from a plant of this kind?

A. Plant of which kind?

XQ. 162. Plant for the fixation of nitrogen?

A. Such as Plant No. 1 for instance, or on the Haber-Bosch process?

XQ. 163. Yes. Take the German Haber-Bosch process.

A. There were no by-products from Plant No. 1.

XQ. 164. There were no by-products?

A. No by-products. I do not know the value of the by-products as they may have been obtained in Germany.

XQ. 165. You do not?

A. No, sir.

XQ. 166. There are certain by-products that you spoke of this morning, such as fizz water. What is that?

A. Carbon dioxide.

XQ. 167. Can that be used in making other forms of ammonia?

A. Yes, sir. It is entirely possible to use that as a source of carbon dioxide in making soda ash by what is usually known as the ammonia soda or Solvay process.

XQ. 168. And that has a valuable use as fertilizer in different forms, and other commercial uses, has it not?

A. Soda ash, no.

XQ. 169. I mean the products in which soda ash can be used.

A. Soda ashes are very valuable commercial products if produced in large amounts.

XQ. 170. You did not consider those by-products

at all or any by-products in discussing the question of cost of the production of ammonia?

A. No, sir.

XQ. 171. But only ammonia as the sole product of the plant?

A. Ammonia as the sole product of the plant.

MR. ANDERSON: That is all I wish to ask, sir.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 172. Professor White, you were asked this morning whether you could give the differences between the process used in Plant No. 1 under the patents of the General Chemical Company and the processes described in the United States Letters Patent known as the Haber patents.

A. Yes, sir.

RDQ. 173. You said that you could, but that you had obtained the information in secrecy or under pledge of secrecy?

A. Pledge of secrecy.

RDQ. 174. To whom did you make that pledge?

A. United States Government.

RDQ. 175. Did you obtain that information in any way in any confidence or under any pledge of secrecy from anybody other than the United States Government?

A. No, sir.

RDQ. 176. Several times this morning, whether you talked of the General Chemical Company's process or the Haber process, you have used the word "Haber." Is that word "Haber" when applied to the production of ammonia by the synthetic process used as a sort of generic term?

A. It is very commonly used in popular discussions generically to cover all of these direct synthetic processes.

RDQ. 177. And you have used it in some respects that way?

A. I have used it in that sense, and possibly before some of the Congressional committees and other semi-popular occasions.

RDQ. 178. You were asked upon cross-examination whether people do not buy patents and pay large sums of money therefor. I think you said that was the fact. Have you ever known of anybody buying a patent that did not get the know-how with it?

A. I do not believe so.

MR. KRESEL: That is all.

MR. ANDERSON: You may stand aside, Colonel.

(Witness excused.)

ALFRED H. WHITE resumes the stand.

RE-CROSS-EXAMINATION (Continued).

By MR. ANDERSON:

RXQ. 179. Colonel White, do you recall having seen that letter? (handing witness).

A. Yes, sir.

RXQ. 180. And do you remember its substance?

A. I want to read this letter; I want to see what it says.

MR. KRESEL: Is that the original?

MR. ANDERSON: No, it is a copy. We have not the original. It is a copy from the original in the Department.

THE WITNESS: I am not sure whether I ever saw that or not. It seems a peculiar letter, in that it is directed to the Acting Chief of Ordnance of the U. S. Army, and refers to the Navy Department.

RXQ. 181. It is also entitled, "Attention, Col. J. W. Joyes in charge Nitrate Division," is it not?

A. Yes, sir. I do not believe I ever saw that.

MR. KRESEL: What do you want to do with this?

MR. ANDERSON: I want to put that in just to show the position in which the Government is placed with respect to this information.

MR. KRESEL: I am perfectly willing that you should put that in. I think you ought to put the original in, but if you say that is a copy I will admit that.

THE COURT: It is admitted.

MR. ANDERSON: I would ask leave to introduce in evidence letter dated April 19, 1918, to the Acting Chief of Ordnance, attention Col. J. W. Joyes, in charge of Nitrate Division, signed by the General Chemical Company, by the Vice President, to be read as Plaintiff's Exhibit No. 656. I only want to call attention to one paragraph of the letter. (Reads letter.)

THE COURT: Is the General Chemical process the Haber process under those patents?

MR. ANDERSON: The General Chemical process is the one used at Muscle Shoals, sir.

THE COURT: Let me put it this way: Does the Government now contend that the General Chemical process is the process under the group of 58 or 59 patents or any of them?

MR. ANDERSON: The Government contends that they are basically and in idea the same, but that there has been a modification of the process in its operations or in its use—an effort to modify the same at Muscle Shoals, and that that effort was the one responsible for the failure.

THE COURT: I wonder whether I can put it this way: Is it the Government's contention that

the process of the General Chemical Company embodied in the Sheffield Plant or in Plant No. 1 is that an infringement in any manner, in any way, upon the Haber patents or any of them?

MR. ANDERSON: The word "infringement," if your Honor please, is a little difficult to define technically. But we do contend that the basic idea in the two is the same and that the so-called Haber-Bosch process covers the essential features of those two institutions.

THE COURT: You see, "infringement" is the word that I have to use, because it is the technical and accurate word. If the process of the General Chemical Company is not an infringement of the Haber patents or any of them, then I am not concerned with the process of the General Chemical Company. I am not sure that I am concerned with the process of the General Chemical Company even if it be an infringement of the processes described in the Haber patents or some of them. But I am quite clear that I am not concerned with them if the process of the General Chemical Company is not an infringement, although it seems to me that it is of interest, possibly of importance, to know the position of the Government with respect thereto.

MR. KNIGHT: The only objection, if any, to the use of the word "infringement" is because it means without right. It implies a breach. No such contention has here been raised. I do not know whether that comes into this case. The Government's position, however, is that the invention of the patent was used there.

THE COURT: I am going right straight across. There is no way around in this problem. What I want to know is this. If the General Chemical Company has a right, so far as the United States

is concerned, to use the Haber processes under the Haber patents or any of them, first, where did it get that right?

MR. KNIGHT: I did not hear the last part.

THE COURT: You said your difficulty in answering my question was with regard to the word infringement, that that implied a use without right. Undoubtedly that is so. But just at the moment I am at a loss to know why you put it that way, because I do not understand just where the Chemical Company got its right to use the processes of the Haber patent.

MR. KNIGHT: I am afraid I have to confess ignorance of the early part of the case. The point I wanted to make was that the Government's position so far as the process is concerned, is that it does use the invention of the Haber patents.

THE COURT: Then in view of the letter, is it not upon you to show how they used it rightfully?

MR. KNIGHT: If that is one of the issues in this case. I supposed the only question was whether that illustrated the value of these patents, not on the question of whether any breach of right was occurring.

THE COURT: I am at a little loss myself and my questions are only to find some solid footing.

MR. KNIGHT: I am feeling my way as your Honor leads me.

THE COURT: I am glad I have company. Let us try to find our way out. There is no better time to do it than now. Won't you read to me the last paragraph of the letter?

MR. ANDERSON: I may state, for your Honor's information, that the last paragraph of that letter is a quotation from the tender of contract put in yesterday between the United States Government and the General Chemical Company.

THE COURT: No, Colonel Anderson. There is nothing behind my question that is not shown on the face, so far as I know. My inquiry is this. If the United States took over the processes of the General Chemical Company and used them in Plant No. 1 under acquiescence, for want of a better term, understanding or agreement and that the rights of the General Chemical Company in and to the processes there employed were absolute, so far as the United States is concerned, you can take that as one branch of the proposition. Now then, I had gathered from things that transpired here that your contention was in direct conflict with that, namely, that the process of the General Chemical Company was, if anything, not a different process from the Haber process, but was—possibly you could go so far as to say that it was an improvement of the Haber process or a development of the Haber process. But then, you are immediately saying that it is an infringement of the Haber process unless you point out to me how it rightfully obtained the privilege of using the process of the Haber patent.

MR. KNIGHT: Since your Honor asked me that Chemical Company was working under licenses both from the Federal Trade Commission and The Chemical Foundation.

MR. KRESEL: Oh, no.

MR. ANDERSON: Will you permit me to state the facts, and if I state them incorrectly, I will stand corrected. I do not always know myself, because this case is too varied for me. Here is the situation:

The Haber-Bosch processes were being licensed by the Federal Trade Commission in 1918; these patents. A license was outstanding to the question I have been informed that the General

Semet-Solvay Company, which is now one of the constituents of the Allied Chemical & Dye Corporation, of which the General Chemical is now a constituent. What their relations were then does not appear of record.

Second, that some time—just when I can not recall without reference to certain papers—but I will assume for this statement prior to that date—there had been issued to a man named Ellis, I think, or someone else, four or five patents relating to this matter of synthetic ammonia production, direct synthetic process. The General Chemical Company had acquired or claimed those patents and they are recited in the very offer that is mentioned here, those four or five patents.

The tender of the General Chemical Company or offer was made and finally resulted in the contracts and agreements by which the Government took over the experimental plant and operations of the General Chemical Company and reimbursed them, took their material and began the construction under contracts with them and others of Nitrate Plant No. 1. It is in that tender that the language referred to in this letter and the subsequent contracts, if I recall them correctly, requires that their processes should be carefully kept secret.

MR. KRESEL: Now, that is not the fact, your Honor; and that section which is quoted in that letter has nothing to do with secrecy.

MR. ANDERSON: I am stating it as I recall it. I am trying to state it as best I can.

THE COURT: I do not understand that there is any question of veracity; merely a question of difference of view with respect to the facts.

MR. KRESEL: The letter speaks for itself. It

says nothing about secrecy. It says that its rights should be preserved to these patents; that is all.

Don't you see, your Honor, this letter is being introduced by Colonel Anderson as a reason why he does not insist on asking Professor White to answer his previous question. He says here that the Government is bound by this contract not to reveal the secrets. Now, I say that it does not have anything to do with secrets at all. The provision is this——

MR. ANDERSON: I am sorry that counsel had to interrupt my statement.

THE COURT: Had you not finished?

MR. ANDERSON: I was interrupted in the middle of a sentence.

MR. KRESEL: I will stop now.

MR. ANDERSON: In those circumstances, I think, when you come to look at those contracts, your Honor will reach the conclusion which I have reached, though I may be in error, that they impose upon the Government very strict obligations of secrecy as to the use of these processes down at Muscle Shoals and Sheffield Plant No. 1; and that this letter taken in connection with those seems to me to impose that obligation.

This morning, when I asked Colonel White about the difference in the processes, he replied that before answering them he would like to ask the Court if he had to disclose the information. That left the matter in a state where I did not feel, not having been associated with it, that I was free to do this thing. That is all there is to it. If I am wrong, all right.

THE COURT: I am not particularly interested in that, Colonel Anderson. That is your secret, it is not mine. You are not bound to disclose it. If that letter constitutes sufficient justification, in

your judgment, for your not insisting on the question, that is solely for your judgment and not for mine. It is your question. You are the one that can release him. I surely shall not, unless you do; and if you do, I will not have to.

The letter is admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 656." (*See Exhibits, Vol. III, page 1634.*)

MR. KRESEL: That is all, professor.

MR. ANDERSON: One minute; I want to ask a question which I asked your Honor leave to ask.

THE COURT: Yes.

By MR. ANDERSON:

RXQ. 182. Between what limits of pressure would you, as an expert, say that the Haber process could be operated commercially?

A. You refer now to the generic Haber process or——

RXQ. 183. Yes, or you can define either, as you see fit.

A. The generic process has been operated at as high as 900 atmospheres, to my knowledge, and down —oh, you can get down to as low as you want to; but the commercial limit is probably around 70 or 80 atmospheres.

RXQ. 184. Do you know whether it has ever been industrially operated before 100 atmospheres?

A. Yes; but not lower than 90, so far as I know.

RXQ. 185. That is the lowest you know of its ever having been industrially operated?

A. Yes, sir.

MR. ANDERSON: That is all.

MR. KRESEL: That is all, Professor.

(Witness excused.)

HARRY A. CURTIS.

HARRY A. CURTIS, called as a witness on behalf of the defendant, being first duly sworn, testifies as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Your full name is Harry A. Curtis?

A. Yes, sir.

Q. 2. And your residence?

A. Washington, D. C.

Q. 3. And what is your profession?

A. Chemical engineer.

Q. 4. Will you please, without my questioning you, tell the Court of your education, your professional career?

A. I was graduated from the Engineering School of the University of Colorado in 1908. Following that I taught chemistry and pursued research work at the University of Colorado until 1913. I then went to the University of Wisconsin and was granted the doctor's degree from the University of Wisconsin in the spring of 1914.

Q. 5. You mean the Ph.D.?

A. Yes, sir.

Q. 6. Had you received any other degrees prior thereto?

A. I had received the Master's degree from the University of Colorado in 1910. I returned to the University of Colorado, and——

Q. 7. In what year?

A. In the summer of 1914. And taught chemistry at the University of Colorado until the spring of 1917.

Q. 8. And then?

A. Then I went into military service with the National Guard of Colorado, First Colorado Cavalry. I

was transferred to the Ordnance Department in September, 1917, and assigned to the Nitrate Division of Ordnance. After a few months in Washington, I went to Sheffield U. S. Nitrate Plant No. 1, and established, designed and constructed and operated there an experimental plant for the conversion of ammonia into nitric acid. I was there, with occasional absences, until January of 1919.

Then I returned to Washington and was assigned to the Arlington Experiment Station, where co-operative experiments were under way between the Nitrate Division and Bureau of Soils, Department of Agriculture. I remained there until May of 1919, and then went to the Fixed Nitrogen Research Laboratory.

I left the Fixed Nitrogen Research Laboratory in August of 1919 and went to Northwestern University, Evanston, Illinois, as Professor of Chemistry. I was there until February of 1920. I then resigned to become Chief Chemist for the International Coal Products Corporation, New York City.

In September of 1920 I became Superintendent of the Irvington plant of this Company, and in June of 1921 I became General Manager of the Clinchfield Coal Corporation, which is a subsidiary of the International Coal Products.

I remained there in South Pittston, Virginia, as General Manager, until last May, since which time I have been engaged on a nitrogen survey for the Department of Commerce.

Q. 9. Have you any connection with Yale University?

A. Effective July 1st, I was appointed Professor of Chemical Engineering at Yale.

Q. 10. Doctor Curtis, during your war service is it the fact that for a period of two years, the period that you have mentioned, 1917 to 1919, your services

to the Government were in connection with the fixation of nitrogen?

A. Yes, sir.

Q. 11. Did you visit the Experimental Station of the General Chemical Company at Laurel Hill, Long Island?

A. In the spring of 1918 I was brought up from Sheffield and spent some six or eight weeks at this Experiment Station in operation of the experimental plant.

Q. 12. Are you familiar with the Haber patents, these 58 United States Haber patents?

A. Yes, sir.

Q. 13. You have read them, have you?

A. Yes, sir.

Q. 14. Studied them?

A. Yes, sir.

Q. 15. Was the process for making synthetic ammonia that you observed in the Experimental Station at Laurel Hill, Long Island, the process described by those Haber patents?

MR. ANDERSON: I object to that as calling for a conclusion, sir.

THE COURT: That opens up the whole issue.

MR. KRESEL: Your Honor, let me withdraw the question for the moment. I think I can avoid that. The question is withdrawn.

Q. 16. You spoke of an experimental station at Arlington, Virginia, and I think you said the work there was under the joint co-operation of the Bureau of Soils and the Nitrate Division?

A. The Nitrate Division began operating in the summer of 1918. The work, however, had been initiated before that by the Bureau of Soils.

Q. 17. When did you go with that Experimental Station?

A. I went there late in January of 1919.

Q. 18. What was it that was being done at that station? What was the nature of the work that was being prosecuted?

A. Some chemists of the Nitrate Division, along with others of the Bureau of Soils, were attempting to prepare catalysts for the direct synthetic ammonia process and to test those catalysts in an apparatus which had been built there previously.

Q. 19. How many men were employed on that?

A. At the time I first went there, I should say there were thirty or forty.

Q. 20. What kind of men were they? Were they professional men or just common laborers, or what?

A. They were professional men; they were chemists in large part.

Q. 21. What was your position in the work?

A. I was director so far as the Nitrate Division was concerned.

Q. 22. How long did that experimental work on catalyzers continue at Arlington?

A. Until late in May, or possibly the first of June of that year.

Q. 23. Of 1919?

A. Yes, sir.

Q. 24. In that connection did you have before you those patents, the so-called Haber patent group, which referred to catalyzers?

A. Yes, sir.

Q. 25. I now show you Defendant's Exhibits 193 to 209, consisting of 17 patents covering catalysts. I do not want to spend the time to dissect those specifically; but I will ask you to state approximately how many different methods of producing a catalyst are set forth in those patents?

A. I can not give you the exact number; but——

Q. 26. Approximately.

A. It is very large. I should say there were probably fifty or sixty, or larger.

Q. 27. Did you and the men at Arlington there undertake to make catalysts according to the specifications described in those patents?

A. There are very few specifications described herein. So far as they are described, we undertook to make them under these patents.

Q. 28. When you say there are very few specifications, what is lacking in the patents?

A. In general, the situation is this: The patent states the chemical composition of the catalyst, but in all of these patents there is to be found very little regarding the physical conditions, or laboratory technique, which is necessary to have in order to prepare a catalyst with proper physical structure to be active.

Q. 29. Won't you enlarge a bit on that, because I do not quite understand that?

A. The catalyst with which we were principally concerned is that to be found in Patent No. 1,152,930. This patent specifies a large number, some twenty or thirty different elements, and we were, of course, obliged to start out with some one of these, since there are many.

We were somewhat guided in our choice by the fact that we knew at that time that the British had been experimenting along similar lines and it was reported to us that some success had been had with catalysts made up of iron and molybdenum. So we took under this particular patent, example 10, which is as follows:

> Mix together a solution of iron nitrate and ammonium molybdate, so that about equal parts by weight of iron and molybdenum are employed. Evaporate the mixture and heat it until the oxides are produced, and then reduce the mixture with

hydrogen free from contact poison. In this example ammonium vanadate or ammonium tungstate can be substituted for the ammonium molybdate.

It is well known technical information that in preparing catalysts, in order to get the physical structure you have to pay attention not only to the chemical composition, which may be given here, which is given in this case; but you have to pay attention to such matters as the concentration of the solutions, the acidity or alkalinity of the solutions, the temperature at which the solutions are mixed, and the rate at which they are mixed, the way in which they are mixed, and the way in which they are evaporated, and the temperatures to which the mixture after being prepared can be heated before it is reduced, and the temperature at which it is reduced, and the rate of reduction.

Various other things come in, but those things particularly come in, and all those things of which the chemical composition is given in this example, not a word is said about the laboratory technique which is necessary in order to prepare an active catalyst.

Q. 30. Well, up to August, 1919, when, as I understand it, you severed your connection with the Nitrate Division, or the Fixed Nitrogen Laboratory, had they been successful in developing a catalyst?

A. They had not developed a catalyst which could be called commercially successful.

Q. 31. About how much money was used monthly in this experimental work carried on at Arlington first, and then transferred to the Fixed Nitrogen Laboratory?

A. I have not the exact figures of Arlington, but it should run between $4,000 and $5,000 a month, and after we went to the Fixed Nitrogen Research Laboratory, I, as executive officer, had a budget of $25,000 a month to spend on this work.

Q. 32. And to your knowledge, over how long a period did the Fixed Nitrogen Laboratory continue this work on which $25,000 was being spent?

A. I do not know about the amount spent, but the Fixed Nitrogen Research Laboratory is still in full operation.

Q. 33. Yes, but I mean you went with it in February, 1919?

A. The Fixed Nitrogen Research Laboratory in May——

XQ. 34. May, 1919?

A. And at the time I left, in August, the budget of $25,000 a month was still in effect.

XQ. 35. Now, how many men were engaged in the work at the Fixed Nitrogen Laboratory?

A. I transferred to the Fixed Nitrogen Research Laboratory, probably half of the staff which I had at Arlington, and then the scientific directors of the Fixed Nitrogen Research Laboratory brought in a great many more, so that the personnel grew to possibly a hundred, within a few months.

Q. 36. And were they professional men?

A. They were professional men. They were probably amongst the most able chemists of the United States.

Q. 37. Is the catalyst an important feature or element in the synthetic process for the production of ammonia?

A. The catalyst is the heart of the process. There can be none prepared without a successful catalyst.

Q. 38. Now, while you were stationed at Sheffield, did you observe the operation, or attempt to operate Nitrate Plant No. 1?

A. Yes, sir.

Q. 39. Will you state from your knowledge, what were the difficulties in operating that plant?

A. I am willing to state them so far as they had been published in documents which are generally available——

Q. 40. Well, that is—pardon me, what were you going to say?

A. Otherwise I am under the same agreement as to secrecy as Professor White, with regard to the plant.

THE COURT: You may observe that secrecy, Mr. Kresel.

Q. 41. Yes. Now then, insofar as those difficulties had been published by the Government itself, please state, and do it as briefly as you can, but substantially?

A. One of the large difficulties which were encountered down there was the leaks in the pipe and joints and fittings and the apparatus in general, in working with those gases at such high pressures. That difficulty was not——

Q. 42. May I ask you what the pressure was that was being used there?

A. It varied from atmospheric pressure, a little above atmospheric pressure, at the beginning of the process, up to about 1,450 or 1,500 pounds per square inch at the end of the process.

Q. 43. Proceed.

A. Another great difficulty which was encountered was in the removal of the carbon monoxide by means of hot caustic solution. The principal difficulty there was in the matter of finding gaskets which would withstand the action of hot caustic under these very high pressures. There was also difficulty in all of the automatic control apparatus in the plant, or nearly all of it. Most of those controls had been developed for normal pressures, and to attempt to work them under the conditions in the plant was, in general, not successful so that in most cases hand control had to be substituted ultimately in place of automatic control. With regard

to the matter of the scrubbers in general through the plant, it was found that the scrubbing was insufficient. In the matter of recovery of power from the water which had been used for scrubbing out the carbon-dioxide, it was found that the wheel was not properly designed, and that difficulty was not corrected during the time of the plant, although some improvements were made. One other very large difficulty was in the heating of the hydrogen nitrogen mixture before it went into the final catalyst. As the temperature there was high, and the gas under high pressure, the material, although built presumably strong, frequently failed with rather serious results, not fatal, but serious results in the plant. Another difficulty was found in the matter of refrigeration. The refrigeration which had been installed for Plant 1 was found to be entirely inadequate for the removal of the ammonia from the gas, and it was necessary to take all of the refrigeration from the second unit and from the third unit, which had not yet been put in operation, and put them in on the first unit. There were many others. I can go on as long as you please.

Q. 44. Well, I think that is sufficient for the present. Now, Doctor, I am going to put this question to you, and I am going to ask your opinion as to the value of these United States Haber patents——

THE COURT: All of them, or just the catalyst patent?

MR. KRESEL: No, all of them, your Honor.

Q. 44. (Continuing.) Basing your answer to this question upon your experience and your knowledge of the development of the art of fixing nitrogen, your knowledge of the United States Haber patents which have been put in evidence, the fact that the General Chemical Company had developed in the United States a new direct synthetic ammonia process under the

United States Letters Patent now in evidence, the fact that the Claude direct synthetic ammonia process had been or was being developed in France, the lack of information of the "know-how" that has been described showing how the processes covered by the United States Haber patents could be carried out in the United States, the fact that there were other methods of fixing nitrogen, such as the arc, the cyanamid and the cyanide processes, the fact that the cost of producing ammonia by the German Haber process in the United States, according to the statement of Colonel Joyes would have been approximately 16 1-2 cents per pound, and higher than the cost of production of the cyanamid process, the fact that the cost of producing ammonia by the General Chemical process was, according to the report of the Ordnance Department and the Fixed Nitrogen Research Laboratory, at least eleven cents, without making any allowance for capital and starting-up expenses, and with no allowance for any profit at all, the fact that the cyanamid process was well known and had for a number of years been commercially successful, the fact that the production by the direct synthetic ammonia process would necessarily come into competition in the United States with the production of the cyanamid process and the production from by-product coke ovens, and with Chilean nitrates, taking into consideration the lack of skilled personnel to operate under the Haber patents in the United States, even if the information as to how the processes described therein could be successfully carried out had been available, the fact that outside of Germany there was no plant anywhere in the world producing ammonia by the direct synthetic ammonia process described in the German patents, and that the only plant that had been built in the United States, to wit, Plant No. 1 at Sheffield, Alabama, using

the synthetic ammonia process described by the General Chemical Company was not a success; what, in your opinion, was the value of the Haber patents in the United States in the months of February, March and April, 1919?

MR. ANDERSON: Your Honor will note the same objection and for the reasons stated as to the other question.

THE COURT: I will take the answer.

A. I would attach no value whatever to them from the standpoint of manufacturing.

Q. 45. Speaking particularly with reference to these catalyst patents, what would you say about those, Doctor?

A. With reference to the catalyst patents, I would attach no value to them from the manufacturing standpoint, because of the facts that what is there really is merely a starting point for a large amount of research before the catalyst could be developed. You do not buy anything when you get the patent.

Q. 46. Doctor, in your opinion can the German process, the so-called Haber-Bosch German process covered by these patents, ever be operated here in the United States successfully, in your opinion?

MR. ANDERSON: I object for the reasons stated to this same question at various stages of the record, sir.

MR. KRESEL: What is that?

MR. ANDERSON: I object for the reasons stated at various stages of the record.

THE COURT: I am sorry, Colonel Anderson, but I do not happen to recall that question before, and the reasons have escaped my memory.

MR. ANDERSON: In addition to the general objections, the possibility or impossibility of operating under these patents is a question of study

of the processes. I have taken the position all along that he could take the patents and find the processes.

THE COURT: I see what you mean. I did not get your point before.

MR. KRESEL: I will put it this way. I think I can put a question that is not objectionable.

Q. 47. In your opinion, Doctor, would it be possible commercially to operate under these patents in the United States in competition with the other processes?

A. May I ask to what other processes you are referring?

Q. 48. I am referring to the General Chemical process, I am referring to the cyanamid process, I am referring to the Claude process.

A. With the exception of the General Chemical, they are not operating in this country.

Q. 49. The cyanamid?

A. No cyanamid in this country.

Q. 50. Operating in Canada?

A. In Canada; yes, sir.

Q. 51. Will you take that into consideration?

A. May I hear the question again?

(Q. 47. Read as above recorded.)

A. The question is a little difficult, because if we in this country were able to buy what France has bought, the know-how, from the Badische people, I would not be prepared to say that they could not operate, although I would rather doubt that they could in view of developments which have been made in the art, particularly the Claude process, in recent times.

MR. KRESEL: You may examine.

MR. ANDERSON: You may stand aside, Doctor.

THE COURT: Any cross-examination?

MR. ANDERSON: No, sir.

(Witness excused.)

JAMES F. STILES, JR.

JAMES F. STILES, JR., a witness called on behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. What is your residence, Mr. Stiles?

A. Evanston, Illinois.

Q. 2. By whom are you employed?

A. The Abbott Laboratories.

Q. 3. What is your position with the Abbott Laboratories?

A. I am the chief accountant of the Abbott Laboratories.

Q. 4. How long have you been with them?

A. Since April, 1913.

Q. 5. How long have you been their chief accountant?

A. For over six years. I have been manager of the cost department, where all the plant records are kept, for at least that time.

Q. 6. Have you prepared a statement from the books and records of the Abbott Laboratories, showing the cost to the laboratories of research work prosecuted by the laboratories in the production of certain drugs?

A. On the research and experimental cost of those drugs, yes, sir, and chemicals.

Q. 7. Have you such a statement, with reference to the research and experimental cost on cinchophen?

A. I have.

Q. 8. Will you produce it?

A. (Witness hands counsel.)

Q. 9. Have you more than one copy there?

A. Yes, sir (handing counsel).

MR. KRESEL: I will give Colonel Anderson a copy. Colonel Anderson, I will ask the witness a few questions, and then I am going to offer the statement.

Q. 10. Were these figures taken by you from the books?

A. They were.

Q. 11. The books having been kept under your direction?

A. Yes, sir.

Q. 12. When did this work on cinchophen commence?

A. The first factory work order was issued in July, 1917. I was unable to secure from the records in my department the exact date of laboratory research.

Q. 13. You took the factory research and started it with that?

A. Yes, sir. Doctor Volwiler knows more of the detail as to the date of the laboratory research.

Q. 14. On this statement do you show the cost of the material that was used in these researches and experiments?

A. Yes, sir.

Q. 15. And the cost of labor?

A. I do.

Q. 16. And do you show what yield there was of the drug?

A. By factory work order.

Q. 17. And how it was disposed of?

A. Yes, sir.

Q. 18. And what you realized therefrom?

A. Yes, sir.

Q. 19. What do your records show as to the net cost of research and experiments on cinchophen?

A. $15,453.30.

Q. 20. And is all the information with reference thereto on this statement?

A. Yes, sir.

MR. KRESEL: I offer that.

THE COURT: It is admitted.

Received in evidence and marked "Defendant's Exhibit No. 246." (*See Exhibits, Vol. V, page 3228.*)

Q. 21. Have you a similar statement with reference to neocinchophen?

THE COURT: You mean made up under similar conditions?

MR. KRESEL: Made up under similar conditions.

A. I have.

Q. 22. What is the amount shown of expense there?

A. $6,912.48.

MR. KRESEL: I offer that.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 247." (*See Exhibits, Vol. V, page 3229.*)

Q. 23. Have you a similar statement as to procaine?

A. I have.

Q. 24. Made up in a similar way and from similar sources?

A. Yes, sir.

Q. 25. And what is the net amount for research and experiment there?

A. $30,302.77.

THE COURT: That is what drug?

THE WITNESS: Procaine.

MR. KRESEL: Otherwise known as novocain.

THE COURT: It is admitted.

Received in evidence and marked "Defendant's Exhibit No. 248." (*See Exhibits, Vol. V, page 3240.*)

Q. 26. Have you a similar statement made up from similar sources and in the same way, covering acriflavine and proflavine?

A. Yes, sir.

Q. 27. And what does that show as the net cost of research and experiments on those two drugs?

A $12,138.56.

THE COURT: It is admitted.

Received in evidence and marked "Defendant's Exhibit No. 249." (*See Exhibits, Vol. V, page 3241.*)

Q. 28. On each of these statements do you show the dates when the research commenced and how long it lasted?

A. Well, in some cases, the research work and the factory experiment work is still proceeding, and I have noted that on the statements.

Q. 29. Wherever that is the case, that appears on the statements?

A. Yes, sir.

MR. KRESEL: That is all.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 30. Turning to the first statement on cinchophen, where did you get the figures as to the cost of material and the amount of material used in that actual experiment or research?

A. Well, Colonel, all of the material costs are drawn from our stores, any one of the stores in the plant, by the employees assigned to the production of that particular factory work order. These requests are then sent to the department of which I am in

charge, where they are priced and extended at cost to us, delivered in our plant, which is the purchase price plus the delivery charges, if any.

XQ. 31. What do you mean by direct labor?

A. That amount of money which is paid to either laborers or junior chemists and reported on the in-and-out time-cards, that is the start-and-stop time-cards, or else on an O. K.'d time sheet furnished by the foreman daily. The total amount of these time records is extended and balanced with the amount of pay given to each man for each pay period.

XQ. 32. Who determines how much of a man's time, a man like a laborer for instance, in a day shall be apportioned to one piece of experimental work in a laboratory and how much to another?

A. Well, when he starts to work on a given factory works order he punches a time-card, and when his foreman takes him off that job he punches out on that time-card, in which case the man himself shows the time.

XQ. 33. Suppose there are half a dozen pieces of experimental or research work going on in the laboratory at once and there are laborers bringing in materials and moving things about and engaged in assisting these various researches; how would you divide that time between the several researches?

A. I have never come across a case in our plant where one man in our manufacturing department, that is one of these laborers, worked on more than one factory works order at a given time. We have had them in other departments but not in this department.

XQ. 34. Is this the manufacturing department you are talking about now?

A. It says there at the head, "The cost of factory and laboratory research work."

XQ. 35. Dr. Volwiler said that there were five

chemists in the research work and about thirty in the laboratory?

A. Yes.

XQ. 36. How would you apportion the cost of these men working on various classes of work applicable to the Abbott Laboratories?

A. Do you mean in the laboratory department or in the factory?

XQ. 37. I am talking about the laboratory. That is the one I am interested in.

A. You will notice that there is a very small charge in the way of laboratory work, and I purposely attached a little memorandum to this report which, if you want me to, I will read.

XQ. 38. No, I would rather you answer the question direct.

A. Yes, sir.

XQ. 39. The Abbott Laboratories, we were told, make about 1,100 pharmaceutical products. Your research laboratories are engaged in researches applicable to practically all your manufactures which are still in a state of research development, are they not?

A. Yes, sir.

XQ. 40. Your work laboratory, where there were 25 to 30 chemists is also engaged in working out any question that arises in connection with the research, development or improvement of these various products, is it not?

A. Yes, sir.

XQ. 41. How do you apportion between cinchophen and neocinchophen and procaine and acriflavine and proflavine, on all of which research and experimentation was going on at the same time according to these records. How do you apportion the cost among the several experiments or research?

A. Well, all of the research work was not being

done by the same man at the same time. In the case of our laboratory, the chemist reported the amount of time that he spent on the various researches and that amount which was reported to me as having been spent on a particular research is included in this report. Any amounts that have not been reported but apply to sort of general research work do not appear in this report.

XQ. 42. How do you get at department costs? What do you mean by it?

A. That is the indirect expense of the department That includes the department manager's salary, janitors if they have any, power, heat, light, depreciation, etc.

XQ. 43. Factory administration expense is practically overhead, is it not?

A. Yes, sir.

XQ. 44. What do you mean by the item "additional expense for packing, selling and shipping, including royalties paid." I ask particularly what you mean by royalties paid. The other items explain themselves.

A. Well, I have included here under the net amount the amount realized from the yields on these different formulas, the actual cash we received back, from which of course we had to pay a royalty to either the Alien Property Custodian or we have paid to the Chemical Foundation, based on the net sales of these products.

XQ. 45. When you said "Alien Property Custodian," you meant Federal Trade Commission?

A. No, we paid the royalty to the Alien Property Custodian.

XQ. 46. Under the license of the Federal Trade Commission?

A. Under the license of the Federal Trade Commission.

XQ. 47. So that you have been during this entire period and are to the present paying royalties on all of these products to the Alien Property Custodian as representing the Federal Trade Commission, is that true?

A. We are no longer paying royalties on procaine. I think the patent has expired on that.

XQ. 48. But you did pay royalties on it up to the date of the expiration of the patent?

A. Yes, sir.

XQ. 49. And on the others you are paying royalties under those licenses from the Federal Trade Commission under those patents?

A. Or to the Chemical Foundation. We did not pay to both of them at the same time.

XQ. 50. Of course not. And you are manufacturing these products under the licenses either of the Federal Trade Commission or the Chemical Foundation, as the record may show here?

A. Yes, sir.

XQ. 51. And you are paying the royalty charges prescribed by these licenses on all your products, are you not?

A. On these products.

XQ. 52. On all of the products of the character named in your several statements here?

A. Yes, sir.

XQ. 53. That applies to each of the products which you have indicated on the several statements without going through them in detail?

A. Yes, sir.

XQ. 54. To put my question differently—it probably confused you—you have indicated in each instance the amount of royalties paid?

A. Not the amount of royalties paid.

XQ. 55. The amount of expenses, including royalties?

A. Yes, sir.

XQ. 56. All the expenses indicated including royalties?

A. Yes.

XQ. 57. And the royalties there are the royalties under Federal Trade Commission license or the Chemical Foundation, as the case may be?

A. There is one other royalty there in the case of procaine which we paid to Dr. Adams and Dr. Kamm.

XQ. 58. You also paid a royalty on procaine to the Federal Trade Commission, or did until the patent expired?

A. Yes, we paid two royalties on procaine.

MR. ANDERSON: That is all.

MR. KRESEL: That is all; thank you.

(Witness excused.)

MR. KRESEL: The next witness, your Honor, is Dr. Bolton, who is going to talk on dye patents.

ELMER K. BOLTON.

ELMER K. BOLTON was called as a witness on behalf of the defendant, and being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Dr. Bolton, we would like your full name?

A. Elmer K. Bolton.

Q. 2. And your residence?

A. 1201 Shallcross Avenue, Wilmington, Delaware.

Q. 3. And your profession?

A. Chemist.

Q. 4. And by whom are you employed?

A. E. I. duPont de Nemours & Company.

Q. 5. And where is their place of business?

A. Wilmington, Delaware.

Q. 6. Please tell us something about your education and your professional career, Doctor?

A. I attended Bucknell University at Lewisburg, Pennsylvania, from 1904 to 1908, and was graduated from there with the degree of Bachelor of Arts. From 1908 to 1913 I attended Harvard University and received the degree of Doctor of Philosophy. From 1913 to 1915 I worked exclusively on research work at the Kaiser-Wilhelm Institute for Chemie at Berlin. The Institute was located at Dahlem, a suburb.

Q. 7. And what course of study did you pursue there?

A. Organic research work.

Q. 8. If you will permit me to interrupt you, in your college course, did you specialize in chemistry?

A. I specialized in chemistry at Bucknell University and specialized on chemistry at Harvard University.

Q. 9. Now, will you proceed.

A. I was employed by the E. I. duPont de Nemours & Company in August of 1915 and was assigned to research work.

Q. 10. In what department?

A. Well, it was the organic department.

Q. 11. Organic chemistry department?

A. Yes.

Q. 12. Please proceed from there. That was in 1915, you say?

A. In 1915. In 1916——

Q. 13. Before you go to 1916, what was the char-

acter of work that you were doing in 1915 and state whether or no you were doing it yourself or in company with others?

A. I carried out work alone at first. Then after a few months, I think two or three chemists were assigned to me and during 1916 we were working on subjects outside of the field of dyestuffs.

Q. 14. Now, the next year?

A. In 1916 I was given charge of more men, and we began the investigation of some of the dyestuffs which would use intermediates, manufactured at that time by the company for explosive purposes.

Q. 15. Will you please stop there a minute? Up to this time in 1916, to your knowledge, had the duPont Company been making any dyes?

A. It had not.

Q. 16. Now please proceed.

A. During 1916, I believe that ten to twelve men were assigned to me to work on these dyes from intermediates which were available at that time. In December, 1916, I was a member of a group of engineers and chemists which visited the Levenstein plant at Blackley, near Manchester, for the purpose of investigating their methods for the manufacture of intermediates and dyes.

Q. 17. Will you please stop there. The Levenstein plant was located where?

A. At Blackley.

Q. 18. Where, what country?

A. England.

Q. 19. And you and these others were sent there by the duPont Company to do what?

A. To investigate their methods for the manufacture of intermediates and dyes.

Q. 20. And when you say intermediates, intermediates for what?

A. Intermediates for dyestuffs.

Q. 21. How long did you spend in this investigation in England?

A. We remained in England at the Blackley plant about six to seven weeks.

Q. 22. Upon your return to the United States what work did you take up?

A. Upon my return to the United States, I was assigned as an assistant to the manager of the organic division, which supervised all research work on intermediates and dyes.

Q. 23. What year was this that you returned from abroad?

A. In 1917.

Q. 24. Early in the year?

A. We arrived the end of February, 1917.

Q. 25. Now then, please proceed from there. You were assistant then to the general manager?

A. To the manager of the organic division. I was assistant to the manager of the organic division until May of 1918, at which time I was made the assistant manager of the Lodi Works, a small plant purchased by the company at Lodi, New Jersey.

Q. 26. And what was being manufactured at that plant?

A. At that plant, the manufacture of intermediates and dyestuffs was carried out.

Q. 27. From that point on, tell us what you did?

A. I remained at that plant as assistant manager until the first of 1919, at which time I was a member of a group of engineers and chemists which visited the Levenstein plant for the inspection of their processes for the manufacture of dyestuffs and intermediates.

Q. 28. Was this the second visit?

A. This was the second visit.

Q. 29. And this expedition that you speak of was sent by your company?

A. Was sent by the duPont Company.

Q. 30. To study the Levenstein methods?

A. To study the Levenstein methods.

Q. 31. When did you return to the United States?

A. We returned to the United States the latter part of 1918.

Q. 32. And then what was your position with the company?

A. I was then made manager of the organic division.

Q. 33. And how long did you remain in that position?

A. I was the manager of the organic division until the latter part of 1921.

Q. 34. And then what position did you assume?

A. I was then made director of the chemical section of the dyestuff department.

Q. 35. And is that the position that you now occupy?

A. That is the position I occupy at the present time.

Q. 36. So then, you have been with the duPont Company from the very beginning of its advent into the making of dyes and intermediates for dyes, have you?

A. Yes.

Q. 37. Could you, Dr. Bolton, very briefly, tell the Court of the general difficulties, if there were any, which your company and your chemical staff encountered in starting to make dyes and intermediates for dyes. Before we take up any particular patent or process, I would like you just in a few words to tell the Court what difficulties there were, if there were any?

A. The greatest difficulties which we had at that time were making intermediates and dyestuffs of the proper quality, and those difficulties go back to perhaps four reasons: the Research Department at that time consisted of the best chemists that we could get. They were some of the best products of our American universities and colleges, but we had a very great deal of difficulty in working out processes from the patent literature which would give the requisite quality of intermediates and dyestuffs when carried out on a large scale.

Our subsequent experience has shown that many of those processes that we used at that time were obsolete. They were published in the German patent literature, but a great many improvements had been made since the appearance of those early patents.

Another great difficulty that we had was in devising what we call control tests. The reaction is carried out in a piece of apparatus, and it is necessary for us to tell when that reaction was finished. It is not carried out according to an empirical formula of heating for a certain length of time and then discharging the contents of the pot. But we must make very definite chemical control tests which in some cases are simple methods and in other cases are most complicated methods. It was necessary for us to develop that information entirely because there was almost nothing in the literature which we could use.

Q. 38. Now, about plant.

A. Our plant organization consisted of chemists who had had some previous chemical manufacturing experience. We tried to get men who knew how to handle acids and alkalis and the general chemicals that are used in the plant. But none of those men had any previous experience in the manufacture of dyestuffs; so that we had the problem of teaching

those men the proper methods of operating to get the requisite quality of dyes and intermediates.

The third cause of our difficulty, perhaps, was in the design of the equipment. Our chemical engineers had not had any previous experience in designing equipment for this particular industry, and it was necessary for our engineers to learn by making mistakes. So that to-day the machines which we are using in the manufacture of dyestuffs are a great improvement over the original designs and I might add that there is practically nothing in the literature in regard to the best type of machines to carry out certain chemical reactions.

Q. 39. And when you speak of the literature, Doctor, what do you include in that?

A. The literature is really the patent literature, because there is very little outside of that.

Q. 40. Outside of the patents themselves?

A. Outside of the patents themselves.

Q. 41. Now, Doctor, have you finished with that? A. I would like to mention one more difficulty, and that was the problem of training the American workman to carry out a procedure without the slightest deviation, because it is these very small details which make for the success of the process, particularly in the manufacture of the dyes.

Q. 42. I am going to ask you, Doctor, if you can, to classify the various classes of dyes that your company has been manufacturing. Do I make myself plain?

A. Yes.

Q. 43. Will you do that?

A. The largest class of products which we make to-day is known as azo colors. These products as a rule are soluble in water and are dyed from a salt or from a slightly acid bath on to cotton, silk or wool.

Q. 44. Now, that is one class.

A. That is one class.

Q. 45. You make Azo colors. What is the next class?

A. Another important class is sulphur colors. These sulphur colors are insoluble in water and to be applied to the fiber, which is usually cotton, they must be dissolved in sodium sulphide. They go into solution and the cotton has an affinity for the dye in this reduced state, and the dye is absorbed in the cotton and upon exposure to the air the dye is oxidized back to the original color.

Q. 46. So that because you use sulphuric acid, I assume, they are called sulphur colors?

A. They are called sulphur colors because these products are made by the action of sodium sulphide and sulphur upon certain intermediates, and must be applied to the fiber by first dissolving in sodium sulphide to reduce the product to a soluble form.

Q. 47. What other class of dyes do you produce?

A. We make vat dyes, represented by indigo, and by the indanthrene dyes. Our trade name is Ponsol.

Q. 48. I am coming to that. You are going just a little ahead of me. First, what do you mean by vat colors?

A. Vat colors are the class of dyes insoluble in water. They are converted into soluble forms by the action of a reducing agent, which is sodium hydrosulphite, and in the reduced form they are taken on to the fiber and re-oxidized back to the original color by exposure to the air.

Q. 49. Are those what are called the fast colors?

A. They are the fast colors.

Q. 50. "Fast colors" means that light will not destroy them, is that it, expressed in the layman's words?

A. They must have a fastness to light and to washing. We make two distinctions. We have products which are not very fast to washing, but possess good fastness to light. On the other hand, we have products very fast to light and not very fast to washing.

Q. 51. In this class of vat colors you include indigo? Did you speak of indigo?

A. Yes, indigo.

Q. 52. And the indanthrene dyes?

A. The indanthrene dyes.

Q. 53. You said something about you—I mean your company—calling the indanthrene dyes by some other name. What is that other name?

A. Our trade name for the indanthrene dyes is "Ponsol."

Q. 54. Speaking of indigo, first, is that a color that is very extensively used?

A. It is one of the largest colors manufactured at the present time.

Q. 55. Is that now covered by any patent?

A. The dye itself is not.

Q. 56. Do you know when the German patent on that expired?

A. It expired in 1917—I beg your pardon—1918.

Q. 57. Now, the indanthrene dyes; are there German patents covering the class called indanthrene dyes?

A. Yes.

Q. 58. When did your company undertake investigation of the methods of the manufacture of indanthrene dyes and intermediates therefor?

A. It began in July and August of 1917.

Q. 59. Was that when you started your research work?

A. Began the research work at that time.

Q. 60. Can you state to the Court on how many indanthrene dyes your company was prosecuting research during 1917 and 1918?

A. We were carrying out work on eleven indanthrene dyes in 1917 and 1918.

Q. 61. Take indanthrene-blue. Is that a color very extensively used?

A. Indanthrene-blue GCD is perhaps the largest used of the indanthrene class.

Q. 62. And when did your company undertake research work to manufacture that dye?

A. In 1917.

Q. 63. And how long did that research continue?

A. The research continued until we were in a position to manufacture, which was in the fall of 1919.

Q. 64. You have given me a note here on indanthrene-blue 3G.

A. Yes.

Q. 65. Is that a dye extensively used?

A. No, the 3G is used only in small quantities.

Q. 66. When did you start experimenting with that?

A. In May, 1922.

Q. 67. How many chemists were employed by the duPont Company in this research work on indanthrene colors?

A. In the period July, 1917, to January, 1918, the number of chemists was equivalent to five chemists spending their time entirely upon the problem; that is, we have had working more chemists on the problem, but the time was equivalent to five spending their time exclusively on this class of work.

Q. 68. And as you have continued to prosecute your research, what is the highest number of chemists whose whole time was employed in the research?

A. In the year 1919 we had fourteeen.

Q. 69. Take a dye described as indanthrene-golden orange. Did you undertake experimenting with that?

A. Yes, we began the experimental work on golden orange in 1918.

Q. 70. Did you succeed then in producing the color?

A. We have worked on golden orange since that time and we have not succeeded yet in manufacturing golden orange.

Q. 71. And you started when?

A. In 1918.

THE COURT: Suppose we take our mid-afternoon recess at this point. (Here a short recess was taken.)

Q. 72. Doctor Bolton, before I ask you with reference to any particular patent, I wish you would state to the Court the result of your general study of these German patents covering indanthrene dyes, as to whether or no they disclose the processes which, upon investigation, your company found were required to produce the colors; and after you have made the general statement, I shall then ask you as to each particular patent.

MR. ANDERSON: One moment, Doctor, please. If your Honor please, I object to the question in that form. It may be evidence that is material and may be important, and it is therefore our view that the evidence should proceed strictly in accordance with recognized rules with respect to patents and patent processes, with which your Honor is much more familiar than I am; and therefore even at the expense of some little delay, I think it is very much better to proceed under the rule here, because we are going into a territory unknown.

THE COURT: I understand, Colonel Anderson, but I do not know whether this question applies to the "know-how" or whether it is directed to the inadequacy of the disclosure, to the extent of showing invalidity.

MR. KRESEL: Your Honor, I do not want to lead the witness, and that is the reason I have made my question as general as I can. I should prefer that your Honor would take the answer, because that will answer your Honor's question.

THE COURT: Now, what have you to say to Colonel Anderson's objection?

MR. KRESEL: I do not understand that there is any special rule of evidence applicable in patent cases that is not equally applicable in all cases.

THE COURT: I do not know that.

MR. KRESEL: And the question is directed to bringing out from the witness a statement of what he found upon investigation of all these patents, with reference to the disclosure made thereby. I then intend to follow that up by presenting special patents, particular patents, and then ask him to describe the steps that have to be taken with reference to those. Now, if your Honor does not feel that I ought to do that until I have shown the specific examples, and then put that question last, I will follow that course, of course; but I thought it would lead to clarity, and to a real understanding of this witness's testimony if we had that answered first.

THE COURT: I will let you state what you propose to show if you desire it.

MR. ANDERSON: Yes, sir.

THE COURT: Do you desire to be heard further, Colonel Anderson?

MR. ANDERSON: Only to this extent, sir, that

it seems there are general rules in patent practice for us to be able then to take up the question, and I think it should be limited to specific patents, to the end that we may be able to understand the evidence as applied to that. I also wish at this time to renew the objection of yesterday as to all this evidence, for the reasons stated in the objection and motion.

THE COURT: Will you repeat that to me again?

MR. ANDERSON: Yes, I understand the objection which I made yesterday morning to all this evidence was in the form of a motion to strike out what had gone before and an objection to what follows. Your Honor will recall that.

THE COURT: That is all right.

MR. ANDERSON: In which I stated specifically my grounds, outlining the chief basis as that of estoppel to raise these questions.

THE COURT: Yes.

MR. ANDERSON: I wish to renew that in addition to our general objections to this testimony, although it is not necessary, perhaps.

THE COURT: My inquiry was whether it was directed to the question of what he called the "know-how," or going to the extent of invalidity. I will accept your offer, Mr. Kresel, to make this inquiry last, instead of first.

MR. KRESEL: Very well. The question is withdrawn.

Q. 73. Doctor Bolton, please produce, if you will, the patent covering the indanthrene blue R S, so-called?

A. (Witness hands patents to counsel.)

Q. 74. You have handed me two patents. One is No. 724,789, dated April 7, 1903. The other is No.

682,523, dated September 10, 1901. In your attempt to produce this color called indanthrene blue R S, did you have occasion to study one or both of these patents?

A. We studied both of the patents.

Q. 75. As to the one dated September 10, 1901, that of course had expired before April, 1919, but this other one of April 7, 1903, was in force in April, 1919. Please state when you undertook to produce this color, indanthrene blue R S?

A. The experimental work was carried out in July and August of 1917.

Q. 76. You started in July, 1917. Please proceed to state what was disclosed by this patent No. 724,789, whether or no you found it of any assistance in producing this color; and if not, why not?

THE COURT: That is the one issued in 1903?

MR. KRESEL: In 1903, your Honor; the one that is in force.

A. By following the specifications of this patent, we obtained Indanthrene Blue R S, but in low yields and of not very good quality. The Indanthrene Blue R S is valuable because it is an intermediate for Indanthrene Blue G C D, which is the largest product of this series; but Indanthrene Blue R S is not used in very large quantities itself, but is sometimes converted into Indanthrene Blue R P, which is used as a pigment for paper. But the chief value is as an intermediate for Indanthrene Blue G C D. We found that the only way in which we could manufacture Indanthrene Blue R S of requisite quality and in good yields was by inventing a new process of manufacture.

stand just as it is?

THE COURT: Do you want that answer to a question.

MR. KRESEL: I am going to follow it up with

THE COURT: I did not mean that. I want to avoid as many difficulties from now on as we can, and I did not know whether that was opening the door to difficulties or not.

MR. KRESEL: I think I understand your Honor's inquiry. Let me tell your Honor what I thought you meant. I thought that you meant that that would lead us into an inquiry by the other side as to what the new method was.

THE COURT: Exactly.

MR. KRESEL: Is that what your Honor had in mind?

THE COURT: That is it precisely, and if we get into new processes and whether they are new, I think we get into the trade secrets and we get into one or two other incidental matters.

MR. KRESEL: I see the difficulty, your Honor. I will put it another way.

THE COURT: But does this answer stand? I am not suggesting at all that you change it; I am only wondering whether it does stand or not, so I may deal with the situation on the cross-examination.

MR. KRESEL: I will have the answer read.

(Answer to Q. 76 read as reported above.)

MR. KRESEL: I will strike out of the answer the sentence beginning with the words "We found."

Q. 77. Doctor Bolton, how low was the yield that you say was obtained by following the process outlined in the patent?

A. We obtained about 25 per cent of the theoretical yield.

Q. 78. Was it possible to commercially manufacture Indanthrene Blue R S on such a yield?

A. We attempted for a short time in a plant to use this process, but without success.

MR. ANDERSON: One moment, if your Honor please.

THE COURT: Let the answer be stricken out and the question repeated. As many times as you can, if you will answer yes or no, and then modify your answer, rather than to give what would seem to you and to me ordinarily the proper way to get at it, it will save us some difficulties.

(Q. 78. Read as recorded above.)

A. No.

Q. 79. Do you understand the question; that is, the question whether it was possible?

A. I understood the question, and the answer to the question as read is no.

MR. KRESEL: I now offer in evidence this Patent No. 724,789, to be marked as Defendant's Exhibit No. 250.

Received in evidence and marked "Defendant's Exhibit No. 250." (*See Patent Exhibit Book.*)

MR. GALLOWAY: Are you sure those are not in evidence as part of the Federal Trade license?

MR. KRESEL: No, I do not know. I am glad you called my attention to it, and if it be found that these are duplicates, then we will withdraw one so as not to recopy.

MR. ANDERSON: Suppose you put them all in and then we will stipulate out any duplicates in making up the record. We can not find them now, the others are hidden among the debris.

Q. 81. I notice in this patent No. 724,789 there is the specification as to A and B compounds. You take the patent and use that. Will you state what your experience was with an attempt to manufacture according to that specification. What is the B compound?

A. We found that the B compound, which can

be separated from the A compound as described in the specification, consists only of impurities of very little tinctorial value and could never be used as a dye.

Q. 82. In order that I may understand it, does the A compound purport to be, according to the patent, one way of manufacturing a dye, and the B compound another way of manufacturing this dye?

A. They give directions for making the A or the B by modification of conditions, so that under certain conditions you can get almost exclusively A, and under other conditions almost exclusively B.

Q. 83. Are A and B different colors or different grades of this same color?

A. Well, A is a color, and B, according to our experience, the impurities.

Q. 84. So that when you undertake to manufacture the B compound, you get nothing but impurities?

A. Yes, a product of a low tinctorial value which consisted of impurities.

Q. 85. Could you use it at all commercially?

A. I do not believe you could.

MR. KRESEL: I find that that patent is in evidence, so I will not offer it again.

Q. 86. Doctor Bolton, please take the patent No. 1,063,173, covering beta-amido-anthraquinone.

THE COURT: Will you put these patents in and see where you are afterwards, instead of relying on the ones already in.

MR. KRESEL: Yes, I will.

A. I have that patent.

Q. 87. What does that patent purport to cover—what color?

A. This patent covers beta-amido-anthraquinone, which is the intermediate for Indanthrene Blue R S and also for Indanthrene Yellow G, Yellow G being the second in importance to the Blue in this series of dyestuffs.

Q. 88. So that this patent that you now have before you purports to cover the intermediate for the two most important Indanthrene dyes?

A. Yes.

THE COURT: Do those letters after the color mean anything—or are you coming to that afterwards?

MR. KRESEL: I was not, but I am glad your Honor asked that.

Q. 89. What do those letters mean?

A. Those letters mean different brands.

THE COURT: They are just brand marks?

THE WITNESS: Yes. The Indanthrene Blue R S is different than the Indanthrene Blue G C D.

THE COURT: Another way of identifying different colors?

THE WITNESS: Yes, another way of identifying different constitutions.

Q. 90. Did you undertake to manufacture beta-amido-anthraquinone by following the steps outlined in this Patent No. 1,063,173?

A. We did.

Q. 91. What was your result?

A. We found that by following the processes described in the specification of this patent we obtained yields of about 50 per cent of the theoretical and the quality of the product was too poor for use in the manufacture of either the Indanthrene Blue R S or the Indanthrene Yellow G.

Q. 92. Please refer specifically to Example 2 of that patent. What does that recommend as the substance to be used in making the beta?

A. That recommends the use of manganese dioxide as the oxidizing agent.

Q. 93. Did you undertake to carry out that process as described there?

A. We did.

Q. 94. And what was the result?

A. We obtained low yields, and a poor quality of product.

Q. 95. Such a poor quality, as you have described, that could not be used as an intermediate at all?

A. We had difficulty in removing the manganese from the finished material.

Q. 96. Is there another example there, Example 3, and what does that recommend to be used?

A. That recommends the use of sodium bichromate as the oxidizing agent.

Q. 97. Did you attempt to follow out that process?

A. We did.

Q. 98. Was the result any different than the first you have indicated?

A. No different.

Mr. Kresel: I now offer in evidence Patent No. 1,063,173.

Received and marked "Defendant's Exhibit No. 251." (*See Patent Exhibit Book.*)

Q. 99. In this same connection, Dr. Bolton, that is, in the attempt to manufacture this intermediate beta-amido-anthraquinone, did you study any other of these German patents?

A. Yes, we studied this other patent.

Q. 100. What is the number of that?

A. United States Patent No. 1,104,943.

Q. 101. Did you follow out the steps described in that patent?

A. We did.

Q. 102. And what result did you accomplish thereby? Or I will put it this way: Were the results that you have already described as those——

The Court: That is leading.

Mr. Kresel: I am sorry. Repeat the other question.

(Q. 102 repeated as follows):

Q. 102. And what result did you accomplish thereby?

A. We obtained a product which could not be sufficiently purified for use in the manufacture of the blue and the yellow.

MR. KRESEL: I offer that one in evidence.

Received in evidence and marked "Defendant's Exhibit No. 252." (*See Patent Exhibit Book.*)

Q. 103. Now have you before you, Doctor, United States Letters Patent No. 739,145, purporting to cover a process for manufacturing Indanthrene Yellow G?

A. I have.

Q. 104. What is the number?

A. 739,145.

Q. 105. Will you please state whether you followed out the processes or the steps which are described in that patent?

MR. ANDERSON: I object on the ground that he should state the process which he followed.

THE COURT: I thought we had gone beyond that. However, I am going to let you take the answer.

MR. KRESEL: I will put it the other way.

MR. ANDERSON: He has not put it the other way in these questions. He has put in the process which he followed, and then he stated the results.

THE COURT: Then the question is withdrawn, as I understand it?

MR. KRESEL: I withdraw the question.

Q. 106. In your attempt to make Indanthrene Yellow G, please state what process you followed?

A. We carried out experimental work on the processes described in the different examples there contained.

Q. 107. Different examples where?

A. Mentioned in the specification of the patent.

Q. 108. Of this particular patent?

A. Of this particular patent.

Q. 109. And what was the result?

A. And we obtained low yields of Indanthrene Yellow G, and found that the best method of manufacturing Indanthrene Yellow G was mentioned in a rather obscure sentence in this patent.

Q. 110. Will you read that sentence?

A. Instead of "using aluminum chlorid as a condensing agent I can use antimony pentachlorid in the presence of a suitable solvent, such as nitrobenzene, and obtain a yellow-coloring-matter of similar properties." That is just like that known to-day for manufacturing Indanthrene Yellow G.

THE COURT: Is that the one given there as the preferable method or not?

Q. 111. Just read that. Will you answer the Judge's question for us as it was put?

A. In the specification three examples had been described in considerable detail, and in the third example they mention the use of aluminium chlorid, at the end of that paragraph, the following sentence is found——

THE COURT: The one you read?

THE WITNESS: Yes, the one I read.

Q. 112. Now, Doctor, still please keep that patent before you. I want to ask you whether you followed the specifications given in example No. 1.

A. We did.

Q. 113. And what result did you obtain?

A. We obtained a product of poor quality and low yield.

Q. 114. Could it be used commercially?

A. Yes, if they could not get anything else.

Q. 115. Now, take the sample No. 2. Did you follow that out?

A. We did.

Q. 116. What was the result there?

A. Substantially the same result as with example No. 1.

Q. 116-a. How about Example No. 3, which used beta-amido-anthraquinone with aluminium chlorid?

A. We obtained only about five per cent in that. The yield was very poor with the use of aluminium chlorid.

Q. 117. How long did it take you to find out that this sentence tucked away in the last paragraph as you have described was a good process?

A. I do not know the actual amount of time. It was, of course, found by the elimination of all these other possibilities. We did not attach any particular importance to this sentence at first.

Q. 118. No.

A. But after an experiment or two, we found that that did give a rather attractive result.

Q. 119. Now, the second part of that patent covers the production of indanthrene yellow mixed with the blue coloring matters, which is indanthrene blue RS, is it not?

A. Yes.

Q. 120. Now if you follow that, what sort of a product do you get?

MR. ANDERSON: Is that the same patent?

MR. KRESEL: The same patent.

A. This product today is of, I do not believe, any commercial value.

Q. 121. Of none at all?

A. No.

MR. KRESEL: Now let me have the patent please and I will offer that one in evidence.

Received in evidence and marked "Defendant's Exhibit No. 253." (*See Patent Exhibit Book.*)

MR. KRESEL: I have just a few more examples, your Honor. I do not intend to go through 4,500 patents.

Q. 122. Dr. Bolton, please produce patents covering indanthrene golden orange. The numbers are 828,778 and 845,129, and 1,004,433?

A. I find that I have only two.

Q. 123. Let me have what you can produce; see if you can find Patent No. 1,004,433, Doctor?

MR. KRESEL: I offer in evidence Patent No. 876,810.

Received in evidence and marked "Defendant's Exhibit No. 254." (*See Patent Exhibit Book.*)

MR. ANDERSON: No. 876,810, is that one of those you just called for?

MR. KRESEL: Yes.

MR. ANDERSON: I have Nos. 828,878 and 845,129.

MR. KRESEL: Yes, but there is one I did not give you.

MR. ANDERSON: What is the number of that, Mr. Kresel?

MR. KRESEL: No. 876,810, also Patent No. 856,810, which I did not give you before, Colonel Anderson.

MR. ANDERSON: Indanthrene golden yellow.

MR. KRESEL: Indanthrene golden yellow, as I understand the witness.

Received in evidence and marked "Defendant's Exhibit No. 255." (*See Patent Exhibit Book.*)

MR. KRESEL: You can not find the other one?

THE WITNESS: No.

MR. KRESEL: Never mind. We will supply that later.

Q. 124. Please take these two patents, Nos. 856,811 and 876,810, what do they cover or purport to cover?

A. Patent 876,810 covers the production of indanthrene golden orange 2 RT from the dye produced from 2.2¹-dimethyl-1.1¹-dianthraquinonyl. Indanthrene golden orange G is used itself and is converted into a redder shade known as indanthrene golden orange 2 RT.

Q. 125. Now, the other patent that I handed you, what is the number of that?

A. The other patent 856,811.

Q. 126. What does that purport to cover?

A. It covers indanthrene golden orange G.

Q. 127. And is there a third patent numbered 1,004,433, which likewise refers to all processes of making indanthrene golden orange?

A. Yes.

Q. 128. That is the one you have not with you?

A. No.

Q. 129. Very well. Now please state what steps you took under one, two or three of these patents in attempting to make golden orange G and what the result was?

A. (Stricken out).

Q. 130. Please state what result you obtained.

MR. ANDERSON: Would you mind asking him if he followed them all, or if not, which ones?

MR. KRESEL: Strike out the last question.

Q. 131. Did you follow them all?

THE COURT: And if not, which ones?

Q. 131 (continued). And if not, which ones?

A. I am rather handicapped in not having these patents to refer to.

By THE COURT:

Q. 132. You mean the missing one?

A. Yes.

By MR. KRESEL:

Q. 133. Suppose I let that stand over, then, until we get the other patent, and take up another one, and we will return to it. Would you prefer that?

A. I would much prefer it.

Q. 134. I shall now ask you with reference to the patent covering hydron blues. Have you the patent or patents which purport to cover the manufacture of that dye?

A. I have.

Q. 135. How many are there?

A. There are two patents for Hydron Blue R and one for Hydron Blue G.

Q. 136. Please produce them?

A. (Witness hands patents).

Q. 137. Are patents Nos. 919,572 and 956,348 for Hydron Blue R?

A. Hydron Blue R, yes.

Q. 138. And what is the number of that one covering Hydron Blue G?

A. No. 966,092.

Q. 139. Taking first the two patents covering Hydron Blue R, did you follow out all the steps in these two patents in attempting to make that color?

A. We did.

Q. 140. And with reference to the patent covering Hydron Blue G, did you follow out the steps described there?

A. We did.

Q. 141. Please state what result you obtained?

MR. ANDERSON: In which case, please?

Q. 141 (continued). In both cases; separating them, of course, as you go along.

A. We found that it was not possible to manufacture Hydron Blue R or Hydron Blue G of commercial quality by following the specifications of these patents. Moreover, the yields were too low to make the processes commercially possible.

Q. 142. I would like you to state a little more with reference to the last ground that you assign. What do you mean that it could not be done commercially?

A. Hydron Blues are competitors to Indigo and Sulphur Blues. Indigo at the present time is selling at 20 cents a pound, compared with the pre-war price of about 15½ cents a pound. Sulphur Blues, of the concentration which are marketed today, are about equivalent to pre-war prices as the result of a very keen competition in this line of products; so that Hydron Blues must be manufactured at a low price, and that means manufactured in high yields in order to compete with these products.

Q. 143. And did the results that you obtained by following out the steps outlined in these three patents, where they gave you any yield at all, give you any such yield as would make it possible to manufacture and sell in competition with Indigo and the other product that you have described?

A. It would not be possible for us to manufacture with the yields obtained by following the specifications of the patents.

Q. 144. How long did your company spend in experimenting under these patents, trying to make Hydron Blues?

A. The investigation began in the spring of 1918, and the experimental work is about completed at the present time.

Q. 145. You have not produced yet?

A. Not on a large scale.

Q. 146. What sort of men did you have on this work?

A. We had first-class chemists. They were good research chemists.

THE COURT: What I want to know is whether they were skilled in this particular art.

Q. 147. Men that were skilled in this particular art?

A. Who had had no previous experience with this type of color, but men who have had experience with the manufacture of Sulphur colors.

Q. 148. They had experience in manufacturing dyes?

A. They had experience in manufacturing dyes.

Q. 149. I think that is what the Court meant by "in this art." Did you confine this experimental work to the same men all the time, or did you put other men on it?

A. We have had three different sets of men on this problem to try to arrive at the results.

Q. 150. Doctor Bolton, I have not asked you for the result of all your experiments under all these patents. Did your company prosecute research work under others of these German patents than those to which I have specifically called your attention?

A. We have.

MR. ANDERSON: One moment, sir. Go ahead. I will wait for the next question.

THE COURT (to Witness): Do not answer the next question until Colonel Anderson has had time to object.

Q. 151. As to such as I have not called to your particular attention, are you prepared to give any information that you have with reference thereto as to the result of your investigations?

MR. ANDERSON: I have no objection to his answering that question specifically, "I am" or "I am not," as long as he does not go into his answer.

THE COURT: I miss that question.

Q. 151 (continued). Did you understand my question?

MR. ANDERSON: Will you read that, please, Mr. Stenographer.

(Q. 151 repeated as above recorded.)

MR. ANDERSON: That calls for yes or no.

Q. 151 (continued). Just say yes or no?

A. Yes.

Q. 152. Doctor Bolton, can you state how much it has cost the duPont Company to carry on the research and experimental work under these German patents in its attempt to manufacture dyes according to the specifications described in those patents? Just say yes or no.

MR. ANDERSON: He can answer yes or no, I suppose.

MR. KRESEL: Of course he can.

MR. ANDERSON: Yes, or no, I do not object to.

MR. KRESEL: There is no objection.

A. Yes.

Q. 153. Now, I ask you to state how much was so spent? Do not answer until Colonel Anderson has had a chance to object.

MR. ANDERSON: I object to that, sir, because in the first place, the question is not specific as to time and dates, and in the second place, it does not appear that this gentleman is in charge of the accounts of the duPont Company, and therefore the foundation has not been laid.

THE COURT: You may cross-examine him on that.

MR. KRESEL: I was just going to suggest that counsel may ask the witness questions so as to see.

MR. ANDERSON: I mean that the foundation has not been laid for the question; that is all I want to say, sir.

THE COURT: I think he may answer subject

to your right to cross-examine. With reference to the first, I assume that you mean during the period beginning with 1917?

MR. KRESEL: 1917. He has stated that they started as I recall it, July, 1917; so the period is well-fixed.

THE COURT (to witness): That question means whether you know these amounts of your own knowledge, at first hand, or whether you are in such connection as to be able to state them of your own knowledge. It does not mean hearsay information.

A. I can only say that these accounts are made up monthly and given to me from our laboratory organization for supervision. As for the total amount, that figure was prepared by someone else; but I do know that it is about correct.

Q. 154. Well, let us see now (because I want to meet your Honor's views in the matter). You say that the expenditures are made in the laboratories?

A. The accounts are made up in the laboratories.

Q. 155. Which are under your supervision?

A. Under my supervision.

Q. 156. And they come to you monthly?

A. And they come to me monthly.

Q. 157. And then you know, of course, whether those are correct or not as they come to you?

A. Yes.

By THE COURT:

Q. 158. They are not sent to you for that purpose, as I understand?

A. Yes, to supervise the amount of money spent.

By MR. KRESEL:

Q. 159. What I understood you to say was that as to the total you have obtained that now from whom?

A. From one of our accountants.

MR. KRESEL: Now, Colonel, is there any objection?

By MR. ANDERSON:

XQ. 160. I would like to ask when Dr. Bolton became the head of the Research Laboratory?

A. Since the last of 1921.

MR. ANDERSON: Well, then, I do not think he can testify to expenses incurred from 1917 to 1921.

MR. KRESEL: I will follow that up.

By MR. KRESEL:

Q. 161. What did you have to do prior to 1920 with the expenses and development work?

A. They came to my attention from time to time, but I did not follow them closely.

Q. 162. Prior to 1920?

A. No.

By MR. ANDERSON:

XQ. 163. Were you not in New Jersey prior to 1920?

A. I was there from May of 1918 to the first of 1919.

By MR. KRESEL:

Q. 164. Can you segregate the total amount so as to give us the amount for the period from the time that you became head of the research work? Have you the figures in such shape before you that you can segregate it?

A. No.

MR. ANDERSON: If you will pass that question by, if you have something else to examine him on, it is quite possible that I can go with you and Dr. Bolton and reach a conclusion. I only want to be in a position so that I can find these facts out accurately from the person who testifies.

THE COURT: Will you give him the figures so that he can check them?

MR. KRESEL: Certainly.

Q. 165. Mr. Bolton, I shall ask you to give us separately the amount that it has cost in research work for the indanthrene dyes, the amount that it has cost for the sulphur colors, and the amount of research work and the cost thereof on indigo. But we will take those up with Colonel Anderson later.

MR. KRESEL: At this time I offer in evidence Patents Nos. 919,572, 956,348 and 966,092.

Patent No. 919,572 received in evidence and marked "Defendant's Exhibit No. 256." (*See Patent Exhibit Book.*)

Patent No. 956,348 received in evidence and marked "Defendant's Exhibit No. 257." (*See Patent Exhibit Book.*)

Patent No. 966,092 received in evidence and marked "Defendant's Exhibit No. 258." (*See Patent Exhibit Book.*)

Q. 166. Dr. Bolton, a copy of Patent No. 1,004,433 that you did not have before you before has just been handed to me; so I shall return and inquire of you with reference to indanthrene golden orange. I think I had already asked you whether you had followed through the process described in all three patents. I now ask you to state what results you obtained therefrom.

MR. ANDERSON: Mr. Kresel, I think that was the question that he said confused him. You asked him whether he followed that process or what process he followed under those patents and he said without the third patent it confused him.

MR. KRESEL: Perhaps you are right.

Q. 167. I shall ask you to state which of the processes you followed through under those three patents, and if not all of them, state what result you obtained?

A. These patents cover only parts of the three processes that are known today for making golden orange G.

Q. 168. You mean that neither one of the patents standing alone nor all three taken together describe a complete method for manufacturing this product; is that what you mean?

A. No; they describe three different methods. The patent literature, when complete, has three different methods for making the indanthrene golden G. So far we have carried out an investigation only of United States Patents 876,810, 856,811, and the process described in 845,129, copy of which I do not have before me. The third process is described by Patent No. 1,004,433. We have not had an opportunity to do very much on this process and our work has been confined to the two different methods described in the other patents mentioned previously.

Q. 169. Setting aside, therefore, No. 1,004,433, state what results you obtained by following the methods described in the other two patents?

A. We have been able to obtain products equal to pre-war quality and perhaps at satisfactory cost, because we had not had any manufacturing experience with them yet, by following a modification of these specifications. But we do not know whether we have the right process.

Q. 170. Just what do you mean by that?

A. I mean that there is a possibility of not having selected the right process from our examination of these patents. There is nothing to indicate to us which process is the best unless we carry out work and very intensive research work on every method described in these patents. We have not been able to get yet to the investigation of this third process described in Patent No. 1,004,433.

Q. 171. How long have you been working on that?

A. We have been working on it since the spring of 1918, but we had not worked all the time. I mean, we go at this problem, work a short time, and then it has been given up and the problem reopened again.

Q. 172. Altogether, how much time have you spent on it?

A. I am not able to state accurately.

Q. 173. Approximately?

A. I think that we could consider three years of intensive work.

Q. 174. I want to ask you particularly with reference to this product as to what kind of plant would be required and about the cost thereof?

A. That is an important question and depends upon the process which is selected. We started out in the beginning, based on a certain experience, and concluded that a process involving a certain number of operations would be required to make this product.

When that information was turned over to our engineering department, we found that it would cost about $250,000 to build the plant. At that time it did not appear to be possible to earn the interest on such an investment and it was decided not to go ahead with this process. Later on, we worked out another process.

Q. 175. No, I won't go into that. I must confine myself and you, Dr. Bolton, to what was done under these patents. Let me ask you this: How many operations—I mean chemical operations—are required in manufacturing under the processes outlined in these patents?

A. In one process it will require about eight operations; in another process, if selected, it will require about four operations.

Q. 176. And when you say another process, do you refer to another process described in these patents?

A. Another process which would be covered by these patents.

Q. 177. Doctor, are there any other vat colors than the indanthrenes?

A. We have the hydron colors, which are vat colors.

Q. 178. Any others?

A. We have other classes of products derived from anthraquinone known as the algol colors, a complete series in itself. We have a class of products known as the hellendone colors, which are what we call indigoids, somewhat similar in constitution to indigo.

Q. 179. And all these that you have mentioned come under the general classification of vat colors?

A. They come under the general classification of vat dyes.

Q. 180. As to the algol colors, do you know who manufactures those in the United States?

A. They were manufactured in small quantities by a concern in Chicago, which has recently failed, in the last six months or so, and I believe they are reorganizing the concern. I think it was the American Vat Color Company, but I am not very familiar with it.

Q. 181. Are these algol colors covered by patents?

A. They are covered by patents.

Q. 182. Do you know who owns those patents?

A. The patents are owned by the Grasselli Chemical Company.

Q. 183. And are the algol colors, being of vat dyes, used for purposes similar to those for which the indanthrene colors are used?

A. They are.

Q. 184. In other words, are they in competition?

A. Certain colors are in competition.

Q. 185. By the way, are there any indanthrenes being imported now from Germany?

A. Yes.

Q. 186. Do you know whether the Germans designate vat colors of the algol class and the indanthrene class interchangeably?

A. The algol colors had been imported within the last year as algol dyes. The name algol now seems to be disappearing and certain products brought in formerly under the name of algol dyes have now been put in the indanthrene class.

Q. 186. In other words, they are so closely related that they are designated as indanthrenes?

MR. ANDERSON: I object, if your Honor please.

THE COURT: The question is leading.

MR. ANDERSON: The witness stated the facts. I think we can argue the case on the facts stated.

MR. KRESEL: Very well, I will leave it there.

Q. 187. Doctor, you started in your testimony this afternoon by saying that the first step taken by the duPont Company in the manufacture of dyes in 1915 was in the use of some by-product from explosives to manufacture an intermediate for dyes. Do you remember that?

A. They were intermediates used at that time in the manufacture of explosives.

Q. 188. I want to ask you to state to the Court whether or no it is possible for a dye factory in time of war to be converted into a factory for the production of munitions, and vice versa, whether it is possible after a factory has been used for the purpose of producing munitions, to convert it into one producing dyes?

MR. ANDERSON: If the Court please, we have had a great deal of evidence on that subject from experts. Nobody has controverted the fact that dye factories can produce explosives, and explosives plants can be subsequently reconverted into dye factories; that the chemicals used in each are related to each other. It is just cumulative.

THE COURT: Your concession is that they are readily convertible?

MR. ANDERSON: It is not a concession. I say that there is any amount of evidence which has been put in here on that subject, on which there has been no controvertial evidence. Why put in additional cumulative evidence here?

THE COURT: He has not reached the limit of his number of witnesses on that—unless you can now save further inquiry on that point, by saying that it will not be disputed.

MR. ANDERSON: It will not be disputed?

THE COURT: Yes.

MR. ANDERSON: If there is any phase of it that would come up in rebuttal and that might seem to me disputable or that should be disputed, I would not like to limit my right to dispute it, and rather than have myself limited in that regard, as to evidence the extent and character of which I can not now determine, I would rather listen to this gentleman repeat the statement told to us half a dozen times. But as long as we have not in this whole proceeding questioned either the iniquities of the Germans or the ability of the Dyestuffs people to manufacture explosives, it seems to me unnecessary to spend the time going through it. But I just want to raise the question.

THE COURT: But you have rebuttal, and whether that would be proper in rebuttal I am willing to determine now.

MR. ANDERSON: No, sir; if I put on rebuttal I think I might raise that question in rebuttal. But I would rather raise it when I want to put that rebuttal on and not at this time.

THE COURT: I am afraid I misunderstand you, Colonel Anderson, because if I understand you the only time the defendant has an oppor-

tunity to build up a case on that point is now and not after your rebuttal.

Mr. Anderson: I withdraw my objection, sir, so far as that question is concerned—reserving my general objection to this evidence as utterly immaterial and irrelevant.

A. I would like to have the question repeated.

(Q. 188 repeated as recorded above.)

A. Yes, it is possible.

Q. 189. I would like you, Doctor, to state to the Court, using as examples such well-known chemicals as may readily occur to you, such as can be readily utilized for the manufacture of dyes and at the same time are basic elements in the manufacture of explosives. Do I convey my question to you?

A. Yes, sir.

Q. 190. Will you state them?

A. We are manufacturing at the present time intermediates like aniline, dimethylaniline, diphenylamine, dinitrophenol, etc., which are used in the manufacture of explosives, and these plants are kept running at the present time; the organization is kept intact as a result of their use in the manufacture of dyestuffs. An intermediate like aniline is one of the largest intermediates in the manufacture of dyestuffs. It is used for making dimethylaniline and diphenylamine. Dimethylaniline is converted readily by nitric acid into the high explosive known as tetryl. The diphenylamine made from aniline is a stabilizer for smokeless powder, and that intermediate is used today in the manufacture of dyes used for paper and silk. Dinitrophenol is an intermediate used for the manufacture of picric acid by treating with sodium sulphide. It is converted into sulphur black.

Q. 191. And is sulphur black a dye?

A. Sulphur black is a dye and is one of the largest manufactured today. There are a number of plants

which are used in the manufacture of dye intermediates which could be used at once in the manufacture of certain high explosives. One of the common reactions in the manufacture of intermediates is known as nitration. We have nitration plants for quite a number of intermediates. In the event of war those plants could be converted at once into the manufacture of high explosives. The sulphur black that we are making today is being made in the plant used during the war for the manufacture of picric acid. But of far greater value than your physical investment is the organization of chemists and of chemical engineers who could be put at once on the manufacture of high explosives and poison gases in the event of war.

MR. ANDERSON: Now I wish to make, in addition to my general objection, the specific motion to strike out on the ground that no one of the reasons given by the witness is assigned in the order authorizing the private sale in this case, and therefore it is entirely immaterial and irrelevant.

THE COURT: I would like to see that order. That is the order of December 3rd?

MR. KRESEL: No, it is February 26, 1919, your Honor.

THE COURT: It is page 111 of the Answer.

MR. KRESEL: The third reason assigned: "Public interest will be best served."

THE COURT: I have it. Objection is overruled.

Q. 192. Doctor Bolton, I now desire to repeat to you the question that I tried to put to you at the beginning of your testimony, and that is for you to state if you will, having now given specifically your experiences with specific numbered patents, I want you to state briefly, the experience that you and your company had in attempting to use the methods outlined in these German patents for the manufacture of dyes.

In other words, in what respect other than such as you have given with reference to specific patents did you find it difficult to utilize the German patents?

MR. ANDERSON: I object, if your Honor please, on the ground that if there is any difficulty in the use of German patents involved in this suit, to which I suppose the inquiry is by inference limited, that the patents should be produced, and the facts should be given by following the process and stating the difficulties in carrying it out. In other words, if that question is answered, it forces us to the necessity, in order to protect the Government, to cross-examine this gentleman on every patent he has used of an alien character, and that goes right straight to the question we had this morning. Now, if there is any matter here material, it is all right to bring it out, but we certainly submit it should be brought out in such a way that we can meet it without being put to that handicap.

THE COURT: Read it. (Question repeated as recorded.)

MR. KRESEL: It is a little involved, your Honor, and I do not wish to put that as involved as that. I will reframe it, your Honor, because I want to be as specific as I can.

Q. 193. Doctor Bolton, in addition to the specific difficulties that you have stated with reference to the specific patents that have been called to your attention, did you or did you not undertake to manufacure under other German patents involved in this case, and if so, will you please point out whether or no you had any difficulty, and what those difficulties were. Do not answer that——

MR. ANDERSON: I object to that question for the same reason as stated in the one preceding and for the additional reason that it probably involves

four questions. It asks if it did or did not have difficulty in manufacturing under any other German patent. That would call for an answer yes or no; and if he made that answer, then we would have a right to call for the production of those patents.

THE COURT: I will sustain the objection and let you present the several questions separately so that I may rule on them.

Q. 194. Doctor Bolton, did you or did you not undertake to manufacture under other German patents than those to which I have drawn your specific attention?

THE COURT: Do not answer. Do you want to know whether he attempted to manufacture? That is the deliberate point. That is, whether he attempted——

MR. KRESEL: May I withdraw the question?

THE COURT: Yes, because that is not the question as I recall it which you have been putting.

Q. 195. Did you or did you not undertake to follow out the steps outlined in other patents than those that have been specifically drawn to your attention?

A. We did.

Q. 196. I am not going to ask you to state specifically what patents they were, or how many. I am going to ask you the general question as to whether or no you found any difficulty in getting results by following the specifications in such patents?

MR. ANDERSON: I object to that, if your Honor please. It calls for the reasons in general. If he wants to ask what was done under a written instrument like a patent, he must first produce the instrument and state what was done, and what were the results obtained from that, and how far it varied.

THE COURT: Generally speaking, true, but I

am wondering, Colonel Anderson, if this witness should be prepared to say that they made an investigation specifically mentioning them, and that in each one, judging from his preceding answers, they found the yield insufficient or the quality poor, and specified accordingly, would we get any further by taking up each patent separately, and probably spending a day or two in going through them. Would you have any more information, and would the Government be any better off in the end?

MR. ANDERSON: The Government would be protected to this extent: We have no possible knowledge of 4,800 patents. I do not even know how many the duPont Company has used—I assume a great many. Now, that being the case, the Government has no possible way of checking this gentleman's answer.

THE COURT: I think you are entitled to have him say whose patents are embraced in this answer and specify those patents.

MR. ANDERSON: If he is asked as to particular patents, and asked whether he followed the process in that patent, and what information he got, I will not be over-technical in applying that to a general answer covering all other German patents.

THE COURT: I think you are absolutely right there, Colonel Anderson, and that his answer must be based on and give you the information as to which of the several patents he is talking about; and then if he can give an answer which is generally applicable to all those—I do not know whether he can or not—why would not we save time by having him do it, and that without any prejudice to the rights of the Government. So far as his specifying the patents which are concerned, there is no doubt in my mind but what you are right on

that point, and right, generally speaking, on the other point, too.

MR. ANDERSON: I recognize your Honor is trying to get a result by the most convenient way, and so am I. I do not want to be putting obstacles in here unnecessarily; but I think your Honor will appreciate that if this evidence is at all material to the issues in this case, it may be important—now whether it is or not I do not know—the interests here involved are so large, that it seems to me for the Government to take the risk of general answers and short cuts, the effect of which in argument it is almost impossible to anticipate, because you can not possibly analyze this record as you go on, and not be in a position to pin down or narrow down to the bare statement of fact every important question with regard to these patents, therefore I am greatly embarrassed here by the desire to do what your Honor wants to do, as tired as I am, and I know the Court is, too, but I have a duty——

THE COURT: I am wondering if we can not do this: Do you happen to know how many patents you are prepared to testify that you have used? (To the Witness.) I do not mean for you to give me the number; but is the number large or small?

THE WITNESS: I do not hesitate to give you the number.

MR. ANDERSON: I do not object to him giving the number at all.

THE COURT: Do you, Mr. Kresel?

MR. KRESEL: Not at all.

THE WITNESS: We investigated all the patents owned by The Chemical Foundation. I am referring only to them. We have investigated forty-two, for which we have licenses at the present time.

THE COURT: And are you prepared to give the number of those licenses?

MR. KRESEL: I have a list of those.

THE COURT: You have made inquiry as to how many of them?

MR. KRESEL: I have made inquiry, I think, as to eight or ten of them.

THE COURT: If those instances are illustrative of what he found with respect to all, is that placing any burden on you, Colonel Anderson, or do you want the witness to go through each of those other thirty-four?

MR. ANDERSON: I have not the slightest idea, sir, what his testimony would be. Those are very important patents, those dye patents, and at the present time I will talk the matter over tonight with people who know more about it than I do, after the time your Honor fixes for adjournment, and I will try to see if I can avoid taking the witness through this labyrinth, without prejudicing the Government.

THE COURT: Have you any objection to stating privately, Mr. Kresel, to Colonel Anderson, what you wish to arrive at?

MR. KRESEL: I have no objection, your Honor.

THE COURT: So that it may aid him in deciding tonight. Have you any other questions you want to put in the next five minutes or shall we adjourn now?

MR. KRESEL: I will stop now.

THE COURT: Then we will adjourn till 8.30 tomorrow morning.

(Whereupon, at 4.25 o'clock P. M., Standard Time, an adjournment was taken until Wednesday, July 18th, 1923, at 8.30 o'clock A. M., Standard Time.)

THIRTIETH DAY.

Wilmington, Delaware,
July 18, 1923, at 8.30 o'clock A. M.
Standard Time.

Before:
HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

ELMER K. BOLTON resumed the stand.

MR. KRESEL: If your Honor please, at the time of the adjournment yesterday afternoon, there was a question pending, and at your Honor's suggestion Colonel Anderson and I have consulted about that question, and I am here to state the agreement that we have arrived at.

Colonel, if I do not state it quite exactly, you will correct me.

Colonel Anderson is willing to withdraw all objections to this question except his general objection as to materiality and relevancy, with the understanding that he may have latitude in cross-examination, and I said, of course, it was perfectly proper that he should have it, because by permitting the question to be answered it saves time necessary to draw it out piecemeal on the direct.

THE COURT: I am very glad you have come to that agreement, because it was in my mind to make that suggestion if you had not. And in making the suggestion I do not mean to indicate that I do not deem this testimony to be of importance to Col-

onel Anderson, and Colonel Anderson will be given the widest latitude with respect to what the witness did under these patents. That does not mean, Colonel Anderson, that you will be in cross-examination, without further consideration, at least, given the latitude of ascertaining what you are not permitted to ascertain with respect to certain other matters.

MR. ANDERSON: What Mr. Kresel stated I think is substantially what we understood, and I understand your Honor's position. I do not want to be put to the burden of a long cross-examination on a short direct; it would be simply taking up unnecessary time.

THE COURT: Otherwise it might take up double time.

MR. ANDERSON: Yes, and that was our understanding. Therefore I said with that understanding, and in an effort to save time, if the witness would try to give fair answers—I know he would on that question—I would waive the necessity for going through it on direct. Of course, when I get to cross-examination, if I run up against your Honor's rulings, then the question will arise on those.

THE COURT: We cannot pass on that until I know what is in your mind about it, and you do know what is in mine.

MR. ANDERSON: Yes, quite so; we understand that.

THE COURT: You may proceed.

By MR. KRESEL:

Q. 197. Dr. Bolton, I am going to read to you the question that remained unanswered, page 4064 of the record, which is this: "Q. 196. I am not going to ask you to state specifically what patents they were, or

how many. I am going to ask you the general question as to whether or no you found any difficulty in getting results by following the specifications in such patents?" If you desire the preceding question and answer read, so as to connect it up, I will do that, but if you understand what is referred to there, will you please answer it?

A. In no instance did the patent give a workable process in commercial yield and pre-war quality. In every instance we had to make the following changes: First, to add ingredients not mentioned in the specification of the patent. We changed the temperature to get the re-action; we changed the quantities of the ingredients; we changed the concentration of the reaction to add additional steps to the operation.

Q. 198. Additional to what?

A. Additional to the process as described in the specifications of the patent.

THE COURT: Mr. Kresel, I do not know whether the question involves trade secrets here in any way. If it does not, the latter part of that answer is all right. If they are involved the latter part of that answer throws the question open to cross-examination, not in public, but to cross-examination on that. I am only serving notice at this time that if that question is not involved, this answer passes; if it is involved, why, this answer opens up that question.

MR. KRESEL: I have considered that, your Honor, because I had been over the matter with Dr. Bolton, naturally, and I do not think that it does involve the question of trade secrets.

THE COURT: That is, trade secrets not involved in the dye patents.

MR. KRESEL: Trade secrets are not involved in the answer to this last question.

THE COURT: Do you agree to that, Colonel Anderson?

MR. ANDERSON: I cannot very well answer the question until I cross-examine further, sir.

THE COURT: Very well. I do not want unnecessarily to get into another complicated situation.

MR. KRESEL: I understand your Honor, and I am very anxious to avoid it myself, and so is the witness for that matter.

Q. 199. Now, Dr. Bolton, you called my attention to some corrections which you wanted to make. Will you take those up now.

A. If your Honor please, I would like to make some corrections.

THE COURT: Make such corrections as you find necessary.

THE WITNESS: On page 4029, in answer to Q. 33. "And how long did you remain in that position?" "A. I was the manager of the organic division until the latter part of 1920." That should be 1921.

On page 4054, the date should be changed from 1920 to 1921. That is in answer to the question "XQ. 160. I would like to ask when Dr. Bolton became the head of the Research Laboratory? A. Since the last of 1920." It should be 1921.

MR. ANDERSON: Doctor, may I call your attention to the fact that the next following the answer on page 4054. "Sincce the last of 1920." Then I said: "Well, then, I do not think he can testify to expenses incurred from 1917 to 1920." I would like to change that.

THE WITNESS: Thank you, Colonel, that should be changed too. Throughout the testimony indanthrene gold and orange is referred to, but it should be "golden orange."

MR. ANDERSON: We will consider that as understood, without making the detailed changes. I do not think it is material to this case, the exact name.

THE WITNESS: On page 4048, in answer to Q. 124. "Please take these two patents, Nos. 856,811 and 876,810, what do they cover or purport to cover? A. Patent 876,810 covers the production of 2.2'-dimethyl-1,1'-dianthraquinonyl, which is an intermediate for indanthrene gold and Orange G." The answer should be: "A. Patent 876,810 covers the production of indanthrene golden orange 2. R T from the dye produced from 2.2'-dimethyl-1,1'-dianthraquinonyl."

On page 4056, in answer to Q. 169. "Setting aside, therefore, No. 1,004,433, state what results you obtained by following the methods described in the other two patents? A. We have been able to obtain products equal to pre-war quality and perhaps at satisfactory cost, because we had not had any manufacturing experience with them yet, by following a modification of these specifications." I would like to add: "We have been able to obtain products by the aid of additional information equal to pre-war quality and perhaps at satisfactory cost, commensurate with the aid of additional information."

Q. 200. Is that all?

A. That is all.

Q. 201. Yesterday I omitted to put in patent No. 1,004,433. Have you that now?

A. Yes, I have one.

MR. KRESEL: I now offer in evidence Patent No. 1,004,433, about which the witness testified yesterday.

Received in evidence and marked "Defend-

ant's Exhibit No. 259." (*See Patent Exhibit Book.*)

Q. 202. Doctor Bolton, there were two other patents that you did not have with you, Nos. 828,778 and 845,129. Do you remember those?

A. Yes, sir.

Q. 203. With reference to indanthrene golden orange?

A. Yes, sir.

MR. KRESEL: I now offer in evidence patents Nos. 828,778 and 845,129.

Received in evidence and marked respectively "Plaintiff's Exhibits Nos. 260 and 261." (*See Patent Exhibit Book.*)

Q. 204. Doctor Bolton, I should like you to state the amount of money that has been spent by the duPont Company in research work and experiment work in the production of dyes from 1917, when you stated they started experimenting, down to May 25, 1923, to which date I understand your figures run.

MR. KRESEL: I might state here, your Honor, that pursuant to your Honor's suggestion, I submitted to Colonel Anderson yesterday these figures, and Colonel Anderson stated that he would let me know this morning as to his view of the matter, but we have not had any answer yet.

MR. ANDERSON: If the Court please, I think the plaintiff will be compelled, under the issues in this case, to ask for the details of those figures. It is obvious that the gentleman now on the witness stand, from his testimony on yesterday, would not be able to give that information; and therefore it seems to me that it would save time and convenience also and be fairer to the plaintiffs to have the information produced by some one who

can respond in cross-examination to the details. I regret to have to make that suggestion.

THE COURT: I think it is perfectly justifiable and I think well taken. The only question is as to whether this witness shall answer as to all and then testify as to that which he has specific knowledge of and be restricted in his answer to that.

MR. ANDERSON: I would very much prefer that he give the information of his own knowledge. I think it is necessary to avoid complications.

THE COURT: Will you restrict him to that, Mr. Kresel.

MR. KRESEL: I do not believe, your Honor, that he can at present segregate this total so as to cover the period of which he has personal knowledge. In view of the position of the Government, I shall not press the question at this time. I shall have to put on another witness for the purpose.

MR. ANDERSON: Mr. Kresel, while you were making these corrections in the record, there was one I noticed.

MR. KRESEL: I have not read the record. These corrections are suggested by Doctor Bolton.

MR. ANDERSON: There was one this morning that I caught at page 4037, the last line of the page. The statement in the record is, "In which I stated specifically my grounds outlining the chief basis as that of a stockholder to raise this question." What I said was, "that of estoppel."

MR. KRESEL: Of course.

MR. ANDERSON: I would like to have that word changed.

MR. KRESEL: That is all right.

THE COURT: Is the duPont Company a licensee of the General Chemical or solely of the Federal Trade Commission?

MR. ANDERSON: I think your Honor means The Chemical Foundation, do you not?

THE COURT: I did.

MR. KRESEL: They started first as licensees of the Federal Trade Commission. Indeed, they took the first license that was ever issued by the Federal Trade Commission, and subsequently they have taken licenses from The Chemical Foundation.

THE COURT: Under additional patents?

MR. KRESEL: Additional patents.

THE COURT: They are still licensees of the Federal Trade Commission—or have those been surrendered?

MR. KRESEL: I have a note of that here, your Honor.

THE COURT: It does not matter if you have not it immediately available.

MR. KRESEL: I think I have.

Q. 205. I wonder, Doctor Bolton, if you can answer that question?

A. We have surrendered our licenses to the Federal Trade Commission and are licensees only of The Chemical Foundation.

Q. 206. Have you not a list of the patents which are covered by licenses, Doctor Bolton?

A. I have (handing it to counsel).

Q. 207. Is this a list, Doctor Bolton, of the licenses that the duPont Company now holds from The Chemical Foundation?

A. Yes.

Q. 208. In which the license number appears and the numbers of the patents that the licenses cover?

A. Yes.

Q. 209. And the products?

A. And the names of our products.

Q. 210. I notice you used the term "Ponsol." I

think you stated that was the duPont designation for indanthrene?

A. For indanthrene.

Q. 211. So, wherever the word "Ponsol" appears here, it means indanthrene?

A. Yes.

MR. KRESEL: Mr. Anderson, you have had a copy of that. I offer in evidence, if your Honor please, this list, showing what licenses the duPont Company holds from The Chemical Foundation, the list showing the names of the patents and the products covered thereby.

MR. ANDERSON: The plaintiff makes all reservations as to this list, in addition to its general reservations. As to the information contained therein, I assume that it is taken from the existing evidence in the record. If it is evidence outside of the record, of what is covered by the patent, I reserve objection to it until I can further examine it. I have not had a chance personally to examine it. In other words, I do not wish to be put in the position of taking that evidence as proof of what products are covered by these particular patents; that is a question that will have to be more clearly brought out than it is at the present time. I am perfectly willing to concede that if this witness testified specifically on the subject, or were permitted to testify in those general terms as to what products are covered by the patents, he would state that those are the products covered by the patents; but I would not waive my objection to that evidence on technical grounds, that is all I want to say.

MR. KRESEL: That is satisfactory, your Honor. Moreover, Colonel, I think that most of the patents that are listed here are already in evidence. If you should find that any are not in evi-

dence we will supply them; you understand that.

MR. ANDERSON: I understand that.

List received in evidence and marked "Defendant's Exhibit No. 262." (*See Exhibits, Vol. V, page 3242.*)

Q. 212. Dr. Bolton, basing your opinion upon your knowledge of dyes, manufacture thereof, upon your knowledge of the patents mentioned and described in this last exhibit which you have studied, based upon your experience in attempting to produce the products covered by these patents by following out the steps of the processes described in those patents, will you state what in your opinion was the value of these patents in the United States in February, March and April, 1919? Please do not answer until Colonel Anderson has made his objection.

MR. ANDERSON: I wish to note objection to the question stated as to other hypothetical questions of that character, because I do not think it has yet been shown that this gentleman's knowledge of value of patents would probably make him an expert. On that question there might be a difference of opinion. As to the other points, I do not think that the question sufficiently embodies the evidence in this case, or that it accurately embodies the evidence in this case, and therefore I have to object to this question for the reasons stated.

THE COURT: You may take the answer.

A. In and of themselves the patents do not have any practical value without the know-how. They have a certain nuisance value which I do not know how to compute in dollars and cents. These patents would prevent the manufacture of the products which they cover, and consequently, unless these patents were out of the way, we would not be able to manufacture the products.

Q. 212. What do you mean that unless the patents were out of the way, you would not be able to manufacture the products? I do not quite get that.

MR. ANDERSON: I want to just note an objection to that, sir. The gentleman has made a statement in explicit language, and I do not think counsel can cross-examine his own witness on a statement which is just as clear and explicit as I have heard in my life, both in the affirmative and negative statements.

MR. KRESEL: I am not cross-examining the witness. I think I am entitled to have an elucidation of the portion of the statement made by the witness.

THE COURT: You may take the answer.

THE WITNESS: May I have the question?

(Q. 213 repeated as above recorded.)

A. I mean that most of these patents that we have under consideration are product patents.

Q. 214. And is it under those circumstances that the duPont Company has taken licenses from The Chemical Foundation?

MR. ANDERSON: I object for two reasons: One is that it is a perfectly leading question; and the second is that the circumstances have been outlined here and the duPont Company are licensees.

THE COURT: The first ground of your objection, I think, is well taken; consequently, it is unnecessary for me to pass on the other.

MR. KRESEL: I will not press the question. You may examine.

MR. ANDERSON: Before beginning the cross-examination of the witness, your Honor, I should like to renew the motion to strike out his entire testimony as to these patents, for the reasons stated in my motion to strike out, and objection to subsequent evidence of the same character, on yes-

terday. I understand your Honor's rulings. I merely want to put the motion on the record at this point.

THE COURT: That is, because if it has no value, it tends to show invalidity of the patents.

MR. ANDERSON: Yes, sir, and for the reasons stated, which I do not think I could recite at this time—I had a memorandum then which I have lost —that the defendant is estopped to put in this evidence on the various grounds stated at that time.

THE COURT: I think that that objection is not well taken, because counsel for the defendant says that this goes to value only and not to invalidity, and I think possibly that it is more true of the testimony of this witness than of the preceding witness.

MR. ANDERSON: Without waiving that objection, I will ask leave to ask the witness some questions.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 215. Doctor Bolton, when did you first take up the specific study of the dye question as distinguished from your general chemical knowledge and experience?

A. It was in the spring of 1916. That is as specifically as I can answer it.

XQ. 216. At that time, if I recall your evidence correctly, you stated that you began this work for the duPont Company?

A. Yes.

XQ. 217. I call it the duPont Company for short. You understand what I mean?

A. Yes.

XQ. 218. If I recall correctly that was a comparatively short time after the completion of your chemical

education which you outlined on yesterday and need not repeat?

A. Yes.

XQ. 219. Up to that time you had had no experience as a practical or industrial chemist, had you?

A. No, I had not.

XQ. 220. Up to that time the duPont Company had not been engaged in the manufacture of either dyes or intermediates, had it?

A. They had engaged in the manufacture of a few intermediates required for the manufacture of explosives.

XQ. 221. Their work, so far as this particular branch of the industry was concerned, was confined to the manufacture of explosives?

A. That is true.

XQ. 222. And the extent of their manufacture or development of intermediates which might be used in dyes was confined exclusively to this purpose, for explosives or use of explosives?

A. Yes.

XQ. 223. You first undertook this work in a very small way as I understood it?

A. On a laboratory scale.

XQ. 224. I mean you were practically working alone. You had one or two assistants, did you?

A. That is true.

XQ. 225. It was really a preliminary study of the subject of dyestuffs, was it not?

A. It was.

XQ. 226. I understood you to say that that work was gradually enlarged under the direction of your company until you employed a number of additional chemists for further experimentation in the laboratory?

A. Yes.

XQ. 227. It was purely laboratory work at that time?

A. Purely laboratory work.

XQ. 228. When did the actual work of industrial manufacture of dyes begin on a commercial scale?

A. In the summer of 1917 we began production in rather substantial quantities of sulphur black, and in the early part of 1918 we began the production of indigo.

XQ. 229. At that time indigo was not a patented dye, was it?

A. It was not covered by any product patent.

XQ. 230. There were, however, certain patents with respect to intermediates of indigo?

A. There were quite a number. I do not recall offhand. But there were quite a number of patents covering different methods for the manufacture of phenyl-glycene, which is an intermediate for indigo.

XQ. 231. Are those patents still in existence?

A. Some of those patents are still in existence.

XQ. 232. Are you a licensee of The Chemical Foundation under any of these patents?

A. We are not.

XQ. 233. Do you make indigo now?

A. We make indigo now.

XQ. 234. Do you use that ingredient?

A. We use that ingredient.

XQ. 235. Is that a German patent?

A. Well, I do not quite understand.

XQ. 236. I mean the patent covering the ingredient?

A. That was a German patent.

XQ. 237. That is still in existence?

A. They were process patents owned by the Germans.

XQ. 238. Do you know whether the patent cover-

ing that process is owned by The Chemical Foundation?

A. It is.

XQ. 239. Can you give me its number?

A. One of the processes for producing phenylglycene is described in United States Patent No. 868,294, patented October 15, 1907.

XQ. 240. Are there any other patents that you know of covering intermediates in the manufacture of indigo?

A. There are other patents covering the processes for producing phenylglycene, this same intermediate. There are also patents for producing other intermediates from which indigo can be made.

XQ. 241. In order not to break the chain of the examination, I will drop that for the moment and return to it later and get you to give me the information. When you began your experience in the study of dyes in the laboratory in 1916 and down to 1917, when you began to make sulphur black, that being the first dye that the company had ever manufactured, how many chemists did you have assisting you?

A. I had at that time in this particular laboratory, I think, as high as twelve chemists at one time. Research work on intermediates was being carried out at another laboratory of the company.

XQ. 242. Where was that laboratory?

A. That laboratory was at Gibbstown.

XQ. 243. Was that laboratory under your direction?

A. It was not.

XQ. 244. Your research work, that of which you can testify from 1916 to 1917, or the first year of your work approximately, was with the aid of a varying number of chemists, which ran at one time as high as twelve?

A. I think so.

XQ. 245. About how many on the average did you have, Doctor, during that period?

A. I believe about nine.

XQ. 246. What particular product or intermediates were you studying at that time—sulphur black?

A. No, sir. We were studying the manufacture of products which could be produced from intermediates available at that time; and these intermediates, you will recall, were being used for the manufacture of explosives.

XQ. 247. Those were commercially available in this country?

A. They were commercially available.

XQ. 248. That, of course, being the period of the war and of blockade, and this country being at war from the beginning of 1917 practically, the number of intermediates available for dyestuffs, in view of the demand for explosives, was very limited, was it not?

A. Very limited.

XQ. 249. Not only the amount of intermediates, but the number in the market; I mean the different character of intermediates was very limited?

A. Very limited.

XQ. 250. Would you mind saying, Doctor, what were the intermediates available at that time?

MR. KRESEL: For what?

XQ. 250. (Continuing.) For the manufacture of dyestuffs. You have already testified that they were intermediates used also or interchangeably in the making of explosives. I want to get the type of intermediates and the number of them that were available at that time commercially?

A. Aniline.

XQ. 251. That is rather a fundamental intermediate?

A. A fundamental intermediate. Dimenthylaniline; diphenylamine; dinitrotoluol, dinitrophenol;

tetramethyldiaminodiphenylmethane, which is a by-product from our dimethylaniline manufacture. These were the intermediates that were available at that time. But the work which was carried out under my supervision was confined to the utilization of aniline, nitrobenzol, dimethylaniline and tetramethyldiaminodiphenylmethane.

XQ. 252. Into what well known dye products do these particular intermediates enter? If that means all of them, I do not want you to give a list of them, but I am just trying to approach the other subject.

A. Aniline and nitrobenzol enter in the manufacture of nigrosine and induline; dimethylanaline enters into the manufacture of malachite green, of methylene blue, of crystal violet and of methyl violet.

XQ. 253. Those are final colors—commercial colors?

A. Those are final colors.

MR. KRESEL: Has the witness finished with those?

MR. ANDERSON: I think he has.

XQ. 254. You can list them all, if you wish, in that general class.

A. They were products of that class. I was just trying to recall all that we were studying.

XQ. 255. When your company began to manufacture in 1917, it confined its operations in finished or commercial colors to sulphur black, did it?

A. Sulphur black.

XQ. 256. Did any of the intermediates which you have spoken of enter into the making of sulphur black?

A. Dinitrophenol enters into the manufacture of sulphur black.

XQ. 257. That is the only one?

A. That is the only one.

XQ. 258. In 1917, when the company began the actual production of this one color, how many chem-

ists were you then employing in your research laboratory work?

A. In 1917?

XQ. 259. Yes.

A. I do not know the size of the organization at that time, because it is necessary to consider not only the chemists employed at the experimental station where I was located prior to the transfer to the Wilmington office, but also the chemists located at the Eastern Laboratory, engaged in studying methods for producing intermediates.

XQ. 260. Your company had had a good deal of experience in producing the intermediates used in explosives, had it not?

A. Only after the outbreak of the war.

XQ. 261. Well, that was in 1914, of course?

A. 1914, yes.

XQ. 261-a. Your company has been engaged for a great many years in the production on a very large scale of explosive materials and powders, has it not?

A. It has.

XQ. 262. Do not these intermediates enter into the making of those materials or products?

A. They do, the manufacture of high explosives.

XQ. 263. In 1917, for instance, when it began the making of dyes for the first time, the company had been engaged in producing these explosives in which aniline and the other intermediates which are common to both dyes and explosives, as you have described, entered, for the three years of the war which had then passed, on a very large scale, had it not?

A. I am unable to state just how much that experience was, because I was not familiar with the early activities in that line.

XQ. 264. Do you not know that prior to the war and the blockade conditions which resulted therefrom,

the intermediates to which you have referred, were very largely produced in Germany?

A. That is true.

XQ. 265. Those then entering into explosives and dyestuffs in common?

MR. KRESEL: And imported from Germany.

XQ. 266. And imported from Germany—were they not?

A. With the possible exception of aniline which had been manufactured here a few years before the outbreak of the war—I do not know how long they had been manufactured, those particular intermediates.

XQ. 267. Aniline you say?

A. Aniline.

XQ. 268. That is one of the most important of all intermediates, is it not?

A. That is one of the most important.

XQ. 269. Many of the others are really products of aniline with other combinations?

A. Many intermediates are built up from aniline.

XQ. 270. Built up from aniline?

A. Yes.

XQ. 271. Now, do you know to what extent the duPont Company had been producing the intermediates of the class which you mentioned which I am now discussing which are then common to both explosives and dyestuffs prior to the war?

A. I do not believe they were producing any of these intermediates prior to 1914.

XQ. 272. Except aniline, you said they were?

A. No, aniline was not produced prior to 1914 by the duPont Company.

XQ. 273. But it was produced in this country and sold commercially?

A. Yes.

XQ. 274. From 1914 on and thereafter during the war, the production of these intermediates entering

into both lines of business, was largely increased in the United States, was it not?

A. It was.

XQ. 275. And did not the duPont Company in the production of explosives, if you know, produce those intermediates on a constantly increasing scale from the beginning of the war and the interference by the blockade?

A. That is true.

XQ. 276. So that in 1917, the duPont Company had had three years of work in the development of the various intermediates entering into explosives, as distinguished from dyestuffs which were common to both in manufacture; is that true?

A. That is true.

XQ. 277. Now, Doctor, speaking of the chemists that assisted you in these preliminary experiments, were they American chemists?

A. They were American chemists.

XQ. 278. Were they young men?

A. Young graduates from universities and colleges.

XQ. 279. Yes. Without stating the actual salaries, were they expensive men as the scale of industrial life goes in America?

A. I cannot answer that question, because I do not know what compensation those men received.

XQ. 280. Would you have any general idea of the character of their comparative values in the commercial market, of those young men—to make my question clear, I mean there are certain chemists of very high standing, who naturally receive and command very high compensation; these young men in the beginning of their experimental work, like all young men, their compensations are comparatively small, are they not?

A. They are comparatively small.

XQ. 281. Now, do you know whether any of these

young men that you had as your assistants had ever had any experience in production, either in the laboratory or in manufacture, of dyestuffs?

A. I do not believe any of them had previous experience before entering the employ of the duPont Company.

XQ. 282. Doctor, is it not a fact that in modern chemistry, as in all other scientific and professional lines, the tendency is toward severe specialization in practice?

A. Yes.

XQ. 283. Is it not a fact that in the very broad field of modern chemistry, any chemist, to produce actual results, must narrow his activities to a specific field; I mean in practical industrial life?

A. I do not know what you mean by "to produce actual results."

XQ. 284. Well, then, probably my question was indefinite. Is it not a fact that in Germany, for instance, the development of the science of chemistry has probably been carried further in its commercial and practical results than other countries, up to the beginning of the war?

A. Yes.

XQ. 285. That is true. Is it not a fact that in Germany the activities of chemists in the industrial field was narrowed to very specific work, and concentrated upon a very specific branch of the chemical knowledge?

A. That is true of certain parts of the chemical organization. I do not believe it was true of their research organization. The manufacturing men who manufactured sulphur colors and had charge of the sulphur color plants, carried out research work in that field.

XQ. 286. In the field of sulphur colors?

A. Although I do not think they were confined exclusively——

MR. KRESEL: Will you finish—exclusively of what?

A. (continuing)—to that line of work.

XQ. 287. Had you, prior to your investigations in the duPont Company, had any experience in the making of vat dyes?

A. I had not.

XQ. 288. Do you know whether any of your assistants had any experience in the production of vat dyes?

A. They had not.

XQ. 289. The company itself had no experience in the manufacture of vat dyes until that work was taken up; is that true?

A. That is true.

XQ. 290. When did they begin the manufacture of vat dyes, do you recall?

A. The manufacture of vat dyes began in the fall of 1919.

XQ. 291. After the war, were not German specialists in these lines of manufacture available for employment in America or by the duPont Company?

A. They were.

XQ. 292. Is it not a fact that the duPont Company did employ a number of German specialists?

A. That is true.

XQ. 293. And is doing so at the present time, is it not?

A. It is.

XQ. 294. Doctor, is it not a fact that the chemical discoveries are nearly all laboratory discoveries? Are they not made in laboratories?

A. They begin usually with laboratory discoveries.

XQ. 295. After a process is worked out or a product developed through chemical experimentation in

laboratories, is it not a fact that it takes considerable additional experimentation and development to make it an industrial or commercial process or product?

A. It does.

XQ. 296. And the more complicated the character of the process, or the more difficult the production of the product from a chemical or engineering standpoint, the longer the period of practical experimentation to convert a successful laboratory experiment into a successful industrial product; is that not true?

A. That is usually the case.

XQ. 297. Do you know how long it took the Germans, after making their laboratory experiments, to develop a commercial indigo?

A. I do not.

XQ. 298. Do you know that in many of these more important dyes after the laboratory experiments had been successfully developed—the process or the product—that it took them sometimes five years to make it a commercial success in manufacturing?

A. I do not know of any——

XQ. 299. Yo do not know that of your own knowledge?

A. No.

XQ. 300. Do you happen to know how much the Badische Company expended in developing the indigo colors after they had succeeded in producing them in the laboratory and thus making them a commercial product?

A. I know the story that is usually told in the textbooks, but——

XQ. 301. But you have not any personal knowledge on that subject?

A. No.

XQ. 302. Is it not a fact in your experience as a chemist, that a successful laboratory experience or laboratory result, be it process or product, often re-

quires considerable modification in detail and development before it can be made a commercial success in manufacturing on a large scale?

A. That is true.

XQ. 303. Have you not had in your own experience—I speak of you as your company—in the production of vat dyes, an entire destruction of your product as a commercial product through error in the use of some metal or material in your vats in which it was produced?

A. I do not know of any instance in the manufacture of vat dyes where the material was entirely destroyed as a result of improper selection of the material of construction.

XQ. 304. I will ask you this: Have you not had actual experience in finding your product in vat dyes made unsuitable for the commercial markets, through having it come in contact with or using in the tanks or utensils in which it was made metals which were destructive of those colors?

A. I do not know of any such experience in our vat dyes.

XQ. 305. Have you in any other dyes had that experience?

A. We have had the case of reduction of yields, as a result of exposure of certain metals.

XQ. 306. And that result was obtained in manufacturing after you had secured satisfactory results in the laboratory?

A. Of course, in our laboratory we carry out the process in glass, and it is another problem to carry out these processes in wood or iron or copper, or whatever the metal may be.

XQ. 307. And an error in the construction of your mechanical appliances, or in the use of a metal, will produce an entirely destructive chemical result in the product, so far as commerce is concerned, will it not?

A. That is true; but we, of course, always look into that point. We will test the——

XQ. 308. Have you not in fact——

MR. KRESEL: Wait a minute, please; he has not finished.

MR. ANDERSON: All right; I thought he had answered fully; if you have not finished, Doctor, finish.

A. (To XQ. 307 continued.) We test the materials which we have in mind for the construction of the plant, to be sure that the reaction is not influenced by these particular materials, as part of the development of any process which we carry out in the laboratory.

XQ. 309. Have you not in a number of instances had to throw away machinery and appliances after you had installed them, because you found them not adaptable to the production of the particular dye that you wished to make?

A. I would not say, Colonel, that we have thrown away machinery. We have modified machinery.

XQ. 310. You have had to do that very considerably, have you not?

A. No, we have not thrown away, or reconstructed this machinery. I want to get this straight now. Are you referring to the manufacture? You still are talking along the line of manufacture?

XQ. 311. I am talking about the manufacture as distinguished from a laboratory?

A. Yes, but not confining it to any particular class?

XQ. 312. No, I am not confining it to any particular class. I am speaking generally. In order to make it quite clear, Doctor, I am trying to get some idea of what I, as a practical man, would assume to be the difficulties of converting a laboratory result obtained in glass, as you say, into a manufactured or commercial or industrial result where you had to do it on a larger

scale. You have had some little experience in that line and I wanted to get from you your experience along those lines.

A. We have modified machinery—we have modernized machinery, as a result of our experience. I mean, our experience is building up every day, and we know how to carry out processes and know the better types of machine today more than we did a year ago, and I hope that we will know more a year from now than we know today.

XQ. 313. That is inevitable in the development of these complicated chemical and mechanical processes which have to be adapted to each other, is that not true?

A. That is true.

XQ. 313-a. In other words, the manufacture of dyes of the delicate colors involved, and the many processes involved, is an extremely complicated business, is it not?

A. It is a very complicated business.

XQ. 314. One of the most complicated of all known chemical and mechanical efforts, is it not?

A. As far as I know it is.

MR. KRESEL: We will stipulate that.

MR. ANDERSON: Well, we have got so far without stipulation, so we will go ahead.

XQ. 315. That being the case, is it not a fact that the human factor, the innate quality of the employee, the experience and the knowledge of the machinery and engineering difficulties as well as chemical, are all essential factors in this production?

A. They have a certain effect.

XQ. 316. You said yesterday that one of the great difficulties you had was teaching the American workmen to follow strictly the process outlined to him; that is true, is it not?

A. That was true.

XQ. 317. You said yesterday that one of your great difficulties had been in the development of your mechanical appliances, as I understood it, and your machinery.

A. That is true.

XQ. 318. You said that one of your great difficulties had been in the control of your reactions in the chemical work?

A. In developing that information.

XQ. 319. All of those questions, including actual practical experience, are of enormous value in the result, are they not?

A. They are.

XQ. 320. I will ask you this additional question: Is it not a fact that many of these dye products require eight to ten distinct chemical steps or reactions before you get the result?

MR. KRESEL: Operations, we have called them.

MR. ANDERSON: All right, we will call them operations.

A. Yes, that is true. From the raw material to the finished dye as many as eight and ten different operations are required.

XQ. 321. And is it not true that the introduction into any of those operations of an intermediate which was deficient in quality, or an error in technique, would destroy the result to a large extent?

A. The influence of quality is quite marked and it would necessitate at some time or other a purification to remove the impurities introduced. But an error in technique—I do not know just what you have in mind, but I assume that somebody has failed to add an ingredient or failed to carry out the reaction or operation as prescribed.

XQ. 322. That would be what I would call an error in technique.

A. Then it would show up in the next step, and that product must be purified or set to one side.

XQ. 323. And start again?

A. And start again.

XQ. 324. That is right. In other words, in chemistry, and especially in these complicated chemical processes by which these products are produced, the delicate colors, technique plays perhaps a larger part than in any other branch of industrial life, is that true—accuracy in technique?

A. Accuracy in technique after having established your procedure.

XQ. 325. Yes.

A. That is the secret of manufacturing these things successfully.

XQ. 326. When you take a patent founded upon a laboratory experience and undertake to convert that process into a large industrial operation or apply it to a large industrial operation or to produce the product therein through the various steps which you have outlined, whether in dyes or in any other business does it not require a very high degree of knowledge and in usual chemical experience a very considerable amount of experimentation and development?

A. Yes, it does require a considerable amount of experimentation and development to complete the chemical details of the process.

XQ. 327. To convert it into an industrial or commercial proposition?

A. Into an industrial or commercial proposition.

XQ. 328. Doctor, at the time that you were manufacturing these dyes, up to the period after the war when the markets were opened up again, you had to manufacture the intermediates also, did you not?

A. Yes.

XQ. 329. And you were faced with a new problem in chemical and industrial life in the production of

these intermediates first and in the production of the final product last, were you not?

A. Yes.

XQ. 330. And you were faced, also, with an important mechanical and engineering problem, of producing the machinery for the commercial utilization of those intermediates, and the manufacture of those final products, were you not?

A. Yes.

XQ. 331. I believe you testified this morning that substantially all the patents under which you manufactured were product patents?

A. Substantially all the patents licensed from The Chemical Foundation are product patents.

XQ. 332. I think you spoke of one yesterday as being a process patent?

A. Yes. One is a process patent. I would like also to add that there are a number of patents for which we are licensed from The Chemical Foundation, which cover the application of products which we sell to the trade; and we have taken out those licenses for the protection of the consumers of these products.

For example, we manufacture a dye which is not covered by any patent, but the conversion of that dye into a lake is protected by patent. You perhaps may know that the Germans not only patented their processes and their products, but they attempted to obtain as far as possible the application of those particular products——

XQ. 333. Don't the Americans do the same thing?

MR. KRESEL: Please do not interrupt him. I think he should be permitted to finish.

MR. ANDERSON: I am not going to interrupt the witness but I thought he was through. If I interrupt you before you are through, please, Doctor, just say "one moment" or something of that sort.

THE COURT: You may complete your answer.

A. (Continuing.) They tried to sew up the situation as tightly as possible.

XQ. 334. Very naturally.

A. Now we have taken out those licenses to extend to our consumers the privilege of making these products without the annoyance of having them apply for the patents. We of course do not know what happens to some of these products, how they use the intermediates which we sell to them.

XQ. 335. So that you undertake to protect first your manufacture of intermediates by licenses; second, your manufacture of the product; and third, the use by your customer of the intermediates which you manufacture, in making such product as he wants to use them in?

A. We have taken out licenses for those purposes.

XQ. 336. You spoke of some of these older patents being obsolete. Is it not a fact that the chemical industry in the production of dyes, as in other branches of that industry, is rather developing and undergoing constant improvement?

A. That is true.

XQ. 337. Is it not a fact that a number of the patents under which your company is licensed were taken out as late as 1913 or 1914, as you recall the dates?

A. Yes.

XQ. 338. Is it not a fact that even in some instances you hold licenses under patents issued since the war on application received by The Chemical Foundation?

A. Yes.

XQ. 339. You spoke of the difficulties with your plant organization. Could you be a little more specific and tell me what was the character of difficulty you meant there?

A. One of the main difficulties was the transfer

of the information to the men who operated the plants, and that goes back to the kind of information which we transferred to the plant, and which the plants used in the manufacture of intermediates and dyes.

XQ. 340. In other words, you developed your processes to what you conceived to be a workable commercial basis in your laboratory and then you transferred them to the manufacturing plant?

A. To the manufacturing plant.

XQ. 341. And there, I take it, you found difficulty with the lack of knowledge or experience on the part of that organization?

A. In obtaining the results substantially the same as obtained on a laboratory scale.

XQ. 342. You would transfer to them this information and the difficulty was in applying it for want of knowledge and experience?

A. Well, the difficulty was of two kinds. It was difficulty in application and difficulty in the quality of the information, which——

XQ. 343. You tried to supply——

MR. KRESEL: Wait a minute, he has not finished.

MR. ANDERSON: Doctor, will you tell me when you want to say something. You had stopped, had you not?

MR. KRESEL: He said "which".

MR. ANDERSON: Then something else occurred to him afterwards that he wanted to say. I hope that counsel will refrain from interrupting. I have no desire to interrupt you, Doctor, and if you want to say anything else, you stop me and say it, without my having to be told from behind.

MR. KRESEL: Here is another thing we agree on. We won't interrupt the witness.

THE COURT: Finish your answer, Doctor, if you have not finished.

THE WITNESS: I have finished.

MR. ANDERSON: I thought so.

XQ. 344. Did you not have a good deal of difficulty with your organization in the use of the intermediates which they had been accustomed to using in explosives, in getting them to apply those intermediates in an effort to secure a different result in dyes?

A. I don't think so. Our aniline was of a good quality at that time. Our dimethylaniline was good. The diphenylamine was a purified product.

XQ. 345. I did not mean that, Doctor. You had men trained in the production of explosives, as you said. Now, did you not have a good deal of trouble in untraining them and turning them into dye manufacturers with that organization? We are now discussing plant organization?

A. It is an entirely different kind of experience.

XQ. 346. It is an entirely different kind of experience?

A. Yes.

XQ. 347. Is it not a fact, Doctor, that in the manufacture of the azo dyes which you said was one of the most important of these dyes, you had a great deal of trouble, owing to the material in the construction of your tanks or vats or vessels for holding these dyes?

A. We had some trouble, yes.

XQ. 348. Did you not in fact have to discard a very considerable amount of production of these dyes for that reason from time to time until you discovered the error?

A. No, there was principally a reduction in yields.

MR. ANDERSON: I understand you are going to put on other witnesses on the cost of research, and so forth?

MR. KRESEL: Yes.

XQ. 349. Doctor, were not the Germans pioneers practically in the production of modern dyes?

A. Were not the Germans——

XQ. 350. Pioneers in the production of modern dyes?

A. Yes.

XQ. 351. Is it not a fact that these processes which you described on yesterday, as covered by these German patents were practically pioneer processes in this great industry?

MR. KRESEL: What do you call "pioneer processes"?

MR. ANDERSON: In other words, "pioneer" has a perfectly definite meaning. It is a man that opens the way through an unknown territory in a forest to settle up a new land, if you want the definition, Doctor, but I do not think you need it.

MR. KRESEL: Thanks for the information.

MR. ANDERSON: I thought probably——

XQ. 352. Go ahead.

A. I think that we can consider that they are. We have not any reason to think otherwise.

XQ. 353. Yes. I would like, if you can, for you to take the various patents or dyes which you defined yesterday and in your statement this morning, and give the appropriate Schulz number, could you; not necessarily on the stand; I am perfectly willing to have this done off the stand, to save time?

A. I intended to do that for you last evening, Colonel Anderson, but it slipped my mind.

XQ. 354. You can do it any time today and put it as a statement on the exhibit as filed. That will be satisfactory?

A. Yes, sir.

XQ. 355. Could you explain briefly what is the function of the Schulz number; what does it mean in the business, for the benefit of the record?

A. Well, it refers to the early compilation by

Schulz and Julius of the dyestuffs known at that time, and the constitutions of the same.

XQ. 356. They are thoroughly understood in the trade and are standard trade numbers, are they?

A. Yes, every one knows what is meant by Schulz.

MR. KRESEL: No. Please do not be laboring under a misapprehension. I do not propose to be bound by anything that Schulz says. You can not use Schulz as evidence against us. In other words, his putting on the number I simply gave you notice is not going to bind us that what Schulz says under that number is the truth.

XQ. 357. Schulz is a recognized authority on the subject in the dye business, is he not?

MR. KRESEL: So is the German hand-book that I tried to use in the cross-examination of Dr. Holdermann, which you kept out.

MR. ANDERSON: If your Honor please, I have not presented the Schulz book.

MR. KRESEL: I know, but I simply give you notice.

MR. ANDERSON: I do not think it is the time to take up that question.

XQ. 358. Would you answer the question, Doctor?

A. May I have the question. (Question repeated as recorded.)

MR. KRESEL: Authority on what?

MR. ANDERSON: On the subject of dyes of that character, and the information which Dr. Bolton has already testified the Schulz numbers imply or give.

THE WITNESS: He is the only authority which gives an identification of dyestuffs; but Schulz was an university professor, and he has made many mistakes in his compilations.

XQ. 359. Yes. All of us do, don't we make mistakes?

A. He of course did not receive the information, I do not believe, from the industry, on some of the products.

XQ. 359a. You do not know the sources of his information, do you?

A. I do not know where he got it

XQ. 360. Yes, that is right. Now, Doctor, you spoke of the identification of the product. Dyes, as I understand, have certain trade names?

A. Yes.

XQ. 361. Did you not have a good deal of difficulty in identifying the patents which applied to the particular products, when you took up a certain dye, until you had made experimentation?

A. We have had considerable difficulty in correlating patent and dye.

XQ. 362. That is what I mean. Are you through? That answers my question if you are through.

A. Yes.

XQ. 363. Are you now prepared to say, Doctor, that the patents which you presented on yesterday cover all the patents seized by the Alien Property Custodian and assigned to The Chemical Foundation which are applicable to the particular dyes or intermediates, which you described or refer thereto in any way?

A. I think that they cover.

XQ. 364. Are you prepared to say that those are all of the patents owned by The Chemical Foundation that apply to those?

MR. KRESEL: Apply to what?

MR. ANDERSON: The dyes or intermediates which he described yesterday, in which the company was engaged in manufacture.

MR. KRESEL: I do not understand that he de-

scribed any particular intermediates or colors. He said: Here is a patent that says you can make X. I tried to make it and could not. That is all he said.

MR. ANDERSON: If your Honor please this is a very intelligent witness and I think he can answer the question. I never saw a more accurate one in my life.

MR. KRESEL: The difficulty is that counsel for the defendant is not as intelligent, and unfortunately he has to understand the question.

MR. ANDERSON: Earlier in the case I became offended at the personal remarks of counsel for the defendant in this case, and now I am only amused. I will go ahead with the examination with your Honor's permission.

THE COURT: Read the question. (Question repeated as recorded.) The objection is that I understand the question is not proper on cross-examination. I will hear you with respect to that, Colonel Anderson.

MR. ANDERSON: That applies to the dyes and intermediates which you said the duPont Company manufactured.

Now, since he has produced a number of patents here as applying to the dyes and intermediates which he described, I think it is entirely proper on cross-examination, for me to ask him if he can say that those are all the patents used by The Chemical Foundation and assigned by the Alien Property Custodian which relate to or apply to those dyes and intermediates.

MR. KRESEL: It seems to me, your Honor, that the confusion comes in in speaking of a dye and intermediate without mentioning the name thereof. Now, if counsel desires to ask this witness whether the product described as being pro-

ducable by a particular patent presented to the witness is, as far as he knows, the only patent which is extant for the production of that particular ingredient, why, that is all right; but there was not any testimony on the direct examination of this witness in general as to any dyes. He took each patent and said:—This patent says we can make hydron blue for instance which we tried to do and we could not. This question is not directed to anything brought out on the direct examination. It is not proper cross-examination. It can not bring out any information that is of any use.

MR. ANDERSON: If your Honor please, counsel asked a direct question as to Dr. Bolton's experience in the manufacture of the dyes and intermediates called for by forty-two patents, a list of which he filed. I now ask Dr. Bolton whether he is prepared to say from his knowledge that those are all the patents assigned by the Alien Property Custodian to The Chemical Foundation, which relate to or have application to any of the dyes and intermediates so mentioned and described by him, and they are all set forth in that statement. If that is not within the limit of cross-examination, I do not know what is.

MR. KRESEL: Let me point out, your Honor, the inefficacy of this whole thing. Let us assume he has one patent for the production of hydron blue, and this witness says:—I could not make it under that patent. Suppose there is another patent for the making of hydron blue—just let us assume it—is that any evidence which has any probative value as to the value of the particular patent that we have here now. How is that material? Suppose there are twenty other patents for the manufacture of hydron blue.

THE COURT: I would be glad to hear you, but I have reached a conclusion in respect to that.

MR. ANDERSON: That is all I have to say.

THE COURT: And that is I have grave doubts as to whether it is cross-examination, but I believe it is important testimony in this case. I will take the answer subject to the exception, Mr. Kresel.

(XQ. 364 repeated as follows: "Are you prepared to say that those are all of the patents owned by The Chemical Foundation that apply to the dyes and intermediates which you said the duPont Company manufactured?")

THE COURT: Is that the form in which you desire to have the question stand?

MR. ANDERSON: Suppose that I put the question differently. I will put it this way?

XQ. 365. Doctor Bolton, are you prepared to testify of your knowledge that the patents which you have filed in your direct examination are all of the patents, among those assigned by the Alien Property Custodian to The Chemical Foundation, which have any application to the manufacture of the dyes and intermediates manufactured by the duPont Company and stated on your list filed this morning?

THE COURT: Do you understand the question?

THE WITNESS: I understand the question.

A. They are not all the patents.

XQ. 366. Is it not often very difficult, in your experience, without testing out the various processes and each of the processes named in any patent, to tell to just what dye products or intermediates such process in fact applies?

A. Yes, it is very difficult. Sometimes you can make a selection of the intermediates which might be employed, but usually it is necessary to carry out in

most cases experimental work to determine which process is the best.

XQ. 367. Is it not a fact that in making a finished dye product or color there is involved a combination of many processes and of various ingredients and intermediates, which are also used in other finished colors?

A. That is true,—ingredients that have a pretty wide application in the manufacture of other products.

XQ. 368. Now taking up the patents which you filed this morning, I will come first to our former discussion of indigo. You stated that there were patents on a number of intermediates used in the manufacture of indigo, and mentioned especially one patent No. 868,294. Are there any other patents that you know of now, which have not expired, applicable to or which purport to cover essential intermediates in the manufacture of indigo?

A. I know there are other patents covering different methods for the manufacture of phenylglycine, but offhand I am unable to state whether those patents have expired at the present time or not. I must refer to the patents.

XQ. 369. Would it be possible for you later to give the information as to the intermediates used or useful in the manufacture of indigo which are covered by or as to which there are patents still in existence, with a list of those patents, and their numbers?

A. Yes, sir.

MR. ANDERSON: Would your Honor permit me a moment? I want to talk to Mr. Knight about certain matters.

(A short recess was here taken at the direction of the court.)

MR. ANDERSON: If your Honor please, during the recess I have found by reference to the notes of the stenographer that I misunderstood a ref-

erence of counsel for the defendant a moment ago as applying to myself, when he intended it to apply to himself. I therefore wish to retract my reply, because in those circumstances my reply was not justified.

THE COURT: I wondered at the basis of it. Let it be withdrawn. You may proceed.

XQ. 370. Dr. Bolton, on yesterday you were asked in regard to your developments under patent No. 724,789, which contains specifiations for what you spoke of as "A" and "B" compounds. Do you recall the matter mentioned?

A. I recall the patent.

XQ. 371. In reply to the question, and speaking of the specifications of the patent, you said: "They give directions for making the A or B by modification of conditions, so that under certain conditions you can get almost exclusively A, and under other conditions almost exclusively B."

MR. KRESEL: Would you mind giving him the page of the testimony?

MR. ANDERSON: The page of the testimony is 4041, and I will also hand the witness the patent (handing patent to witness).

XQ. 371. (Continued.) I would like to ask you to state the exact conditions prescribed by the patent, if they are described, and then to state the exact modifications which you made and to which you referred. It is suggested to me that the answer probably refers to modifications of conditions prescribed by the patent itself rather than those that you made. If that is true, then I withdraw the question.

A. That is true.

XQ. 372. Or I will ask you to answer the question that way, and that will explain?

A. Yes, it means the modification of conditions described in the second example of this patent.

XQ. 373. That is, that the modifications are in the patent and not modifications that you made?

A. In the patent and not modifications that we have made.

XQ. 374. Taking your answer this morning to the general question in relation to these patents, I note you say at page 4070 of the record: "In no instance did the patent give a workable process in commercial yield and pre-war quality. In every instance we had to make the following changes. First, to add ingredients not mentioned in the specification of the patent. We changed the temperature to get the reaction; we changed the quantities of the ingredients; we changed the concentration of the reaction to add additional steps to the operation."

I will take up the first of those and ask you to take up the patent which you took up first on yesterday, covering indanthrene blue RS, I think, and state exactly what ingredients you added and under what process in the patent you experimented?

A. (Witness refers to Defendant's Exhibit 250).

XQ. 375. Now I would like to ask you, first, which of the processes you followed?

A. We tried in the laboratory on a small scale the three processes described in this patent—followed the three examples of the patent specification.

XQ. 376. The patent gives the general specifications and then gives three illustrations; is that what you mean? I haven't it before me?

A. Yes.

XQ. 377. Did you follow in detail the general specifications as illustrated by the three examples?

A. We carried out experiments using the conditions employed in these examples.

XQ. 378. The exact conditions?

A. As closely as we could follow them.

XQ. 379. Doctor, could you be a little more spe-

cific. Could you follow them exactly, or did you have to vary?

A. Yes, we could follow them exactly, in that we used the same conditions as given in the specifications of the patent.

XQ. 380. Did you manufacture your own ingredients or intermediates?

A. We manufactured beta-amido-anthraquinone.

XQ. 381. That is the product?

A. That is the chief intermediate for the manufacture of this dye.

XQ. 382. The patent covers that as a result, does it not? The process described in the patent being a method of producing that particular chemical?

A. Of producing indanthrene blue RS.

XQ. 383. This chemical which you have described there, as covered by that patent, is an intermediate of idanthrene blue RS?

A. Idanthrene blue R S can be considered as an intermediate for idanthrene blue G C D and is sold in very small quantities for itself.

XQ. 384. Now then, this process produces,—what did you call it?

A. Idanthrene blue R S.

XQ. 385. That process in that patent?

A. The process in this patent, No. 724,789.

XQ. 386. Following the process outlined in that patent, example No. 1, what did you get?

A. Example No. 1 gives the method for the production and separation of the products designated as A and B by fusing beta-amido-anthraquinone with caustic potash alone at a high temperature. We obtained low yields following this procedure.

XQ. 387. What temperature did you use?

A. The temperature is specified, 250 degrees Centigrade.

XQ. 388. You used that temperature, employed that temperature?

A. We used that temperature.

XQ. 389. How much did you vary that temperature in your final effort?

A. Well, in our first experiments I believe I can say that we confined ourselves as closely to this temperature as possible. I do not believe that we carried out a very thorough investigation of this particular procedure varying the temperature, the amount of caustic and other conditions, because the yields were too low to make the process appear promising.

XQ. 390. Promising, you mean, from a commercial standpoint?

A. From a commercial standpoint.

XQ. 391. There was no difficulty in producing the result, but the question was of making it commercially?

A. We obtained the product.

XQ. 392. Take the next example, No. 2. What does that call for?

A. No. 2 calls for the production of a melt from which A is the chief product obtained.

XQ. 393. Did you follow the exact process there referred to?

A. We followed the process as outlined in this patent; and as far as my recollection goes we carried out substantially the same process at one time on a work scale. The yields were too low to make the process a commercial possibility.

XQ. 394. In other words, you could not make a profit on it as a manufacturing process under those conditions; you got the result in the laboratory?

A. We obtained the dyes covered by the patent.

XQ. 395. Now No. 3.

A. No. 3: We paid some attention to this process, which called for the production of a melt from

which B is the chief product obtained. Our experience showed that B was a product of a low tinctorial value which we did not believe could be used commercially.

XQ. 396. You paid very little attention to it; you only made a preliminary investigation?

A. Yes, the dyestuff itself seems to be destroyed under these conditions.

XQ. 397. And you never have undertaken to manufacture that product B?

A. No.

XQ. 398. You have only manufactured product A?

A. Only product A.

XQ. 399. I will ask you, Doctor, what additional ingredients, if any, you added in manufacturing product A on a commercial scale, and what change in detail of process you followed?

A. Your Honor, that means the divulging of confidential information which has been acquired after a very considerable period of intense research and investigation and the expenditure of money.

THE COURT: What value, in your case, will that information have if you get it—from your standpoint, Colonel Anderson?

MR. ANDERSON: I do not know what the information is, sir, but if it is a very slight variation or a variation of such character that one experienced in this business and different chemists operating under different ideas and technique in applying this process would arrive at that thing, then it affects this evidence. I cannot tell what is going to be its effect until I hear the answer to the question.

In other words, the view I take here is simply that, having questioned the value of these processes, it becomes necessary for the Government, if this information or evidence is deemed material

by the Court at final hearing, to be in a position to analyze the extent of that variation of process, if any.

THE COURT: Mr. Kresel has said that he had not disputed the validity of the patents. The witness has said that they are paying license fees under these patents. Consequently, they are not disputing, as I understand it, that they are operating under the patents. Hence, I fail to see the relevancy, materiality or evidential value of the precise thing which they are doing. It seems to me that the evidence which is of value consists of the statement of those facts which disclose the time and the expense necessary to develop the process to a commercial scale, whatever that commercial scale is, whether it is a wide or a narrow departure or any departure at all from the process disclosed in the patent. What is your view and contention with respect to that?

MR. ANDERSON: My view would be, sir, that while that may have value as evidence—the weight of which I am probably not prepared just now to express definite views upon—if that is to be considered at all, it necessarily follows that we must have all the facts bearing upon the variation of process, if any—first, to the end that we may ascertain whether that variation was material as affecting in any way the value of the patents and, second, to the end that we may either produce evidence or argue before the Court, if it is a matter for argument, that whatever may have been the experience of the particular user of the patent, the variation was of such a character that one skilled in that particular branch of the art would not have been required, as the patentee was, to take any such steps. Offhand I would say generally that would be the thought that I have in mind.

THE COURT: In other words, that the manufacturers under these several patents might by that be indirectly charged with inability from a practical standpoint to do that which some theorist says after the event can readily be done. Would that be the idea?

MR. ANDERSON: I do not know that your Honor has correctly expressed or summarized my view; because I am not charging these gentlemen with any inefficiency. I am merely stating that I think the extent of their experience and the extent of their knowledge and the character of their effort are all facts going to affect this testimony, if it has any value whatever. My own view is that this testimony under the circumstances which your Honor indicated can have no value; but if it has any, then we must have the complete facts. That is the view on which I ask the question.

THE COURT: I disclaim before I make this statement that I am charging you with the situation which my assumption is going to indicate, and I will assume a theoretical case so as to completely disclaim it—disclaiming either expressly or by any necessary inference any reflection. But if your hypothesis and assumption are true, then is not all business in America in jeopardy, in that it may be charged, inasmuch as it conducts its business on secret processes, with a wrongful act in connection therewith. Using this case as an illustration, solely for that purpose, the only defense in such assumed case possible or that would be completely effective, let us assume, would be a disclosure of certain facts, that they have found that the patents under which they have attempted to work are not workable on a commercial scale and they have spent so much money in develop-

ing them. They either have to disclose that fact or their business is ruined by default. If they disclose that fact, then they are compelled to disclose other facts, namely, the secret processes that have been developed by them through years of study and at the expenditure of huge sums. Then their business is ruined by the disclosure of the processes to the trade. Where is the security for business under such conditions?

MR. ANDERSON: In answer to your Honor's question, that my position too may not be misunderstood, I wish to disclaim any desire to embarrass any American industry in this suit or to jeopardize in the slightest degree its future prosperity. But answering now your Honor's direct question I would say that if we came into Court charging a business in American industry with the use of patents and that industry undertook to meet the charge by saying that they had varied the use of the patent, had not used it, had varied its use, or modified its process in such a way that even if they had used it the value of its use would be very limited in an accounting or otherwise, that burden would be upon them, upon proper cross-examination to show carefully and in detail the limits which they made as a defense; that they could not come into Court voluntarily and attack the value of a property which they were using because they had added value through their own improvement, and then say when brought face to face with the disclosure of the essential facts, to ascertain what they had done by way of adding value or correspondingly decreasing the value of the original improvement—meet it by saying we disclose state secrets. If there is any possible way that that can be avoided as a practical question—of course I shall have to do the best

I can, but my answer to your Honor's question, rather awkardly put I am afraid, is what I have stated.

THE COURT: Do you contend that the people you have charged with conspiracy are coming into Court voluntarily?

MR. ANDERSON: I contend, what I understand to be the case, sir, that every witness who has appeared on the stand for the defendant here has appeared without process or summons. He has appeared by directions presumably, of his superior officers of the corporation. In some instances, these corporations are charged with conspiracy to acquire these patents, and the question of whether they appear voluntarily to attack, not the fact of acquisition, but the value, as a justification for acquisition, is a question which I cannot determine for them. I merely say when I say "voluntarily" I mean that they do not appear by virtue of any process of this court.

MR. KRESEL: May I say a word, your Honor?

THE COURT: You may.

MR. KRESEL: The position that the defendant finds itself in is this: It is brought into court upon a charge that it acquired from the Government property for a consideration which was so inadequate as to shock the conscience of a court of equity. By the same bill the entire chemical industry is charged with having been in a conspiracy to obtain that property from the Government upon such inadequate consideration.

The Government concedes, and that is its only concession, that our only defense, from its point of view, can be that this property was not acquired for an inadequate consideration. The defendant therefore starts out to get evidence to

prove to the Court that the consideration paid was inadequate.

What does the Government do under those circumstances? It says to the defendant practically, and to these alleged conspirators: "As the price for proving to the Court that you are innocent, you must reveal the secret processes that you have worked out to make these products." In other words, they drag us into court upon a charge of conspiracy, upon a charge of defrauding the Government, and then seek to stop the very source of any information that we can get in order to defend ourselves.

And yet the Government desires to be understood as being in favor of developing a chemical industry in this country. How is it possible for the Government to reconcile its position in that respect? I tried in my direct examination yesterday, your Honor, to keep as far away as possible from putting any question to this witness which would make a basis for a claim that upon cross-examination the Government had a right to go into their secret processes.

Apparently I have failed. Apparently this witness has answered upon the direct a question which counsel claims gives him the right to extract from this witness their secret processes. I say it is not proper and it is not right. I should like to use stronger language, but I dare not. Certainly, if this witness is to be compelled to give the processes, at least your Honor will follow the procedure which your Honor outlined in connection with Dr. Volwiler.

But I trust that counsel will see the unfairness—I do not mean to reflect upon Colonel Anderson; I want to be as decent as possible, sir—but I trust that Colonel Anderson even can see the

impropriety, the unfairness, of seeking to have this industry reveal in public, or even in private, the result of years of labor and expense. For the benefit of whom? Who can possibly benefit thereby? Certainly the Government can not, because if it is true that the Government stands for all the people, as Colonel Anderson has said here, it stands as well for this industry, and the Government ought to be protecting the industry rather than attacking it in this way.

MR. ANDERSON: If your Honor please, I am trying a lawsuit and not engaged in the exercise of the general functions and policies of the United States; but I think I may state that the Government is as anxious to protect and safeguard any branch of American industry as any citizen of the United States can be. I know that is my position. However, when I am here in this court, I am charged with a legal duty, and if this evidence is material then the full evidence is essential.

Now it is, I think, proper for me to say that I do not concede that the proof of value is a defense in this case, but in one aspect of the case it might be, an aspect which I do not think ought ever to arise. But since we have to go into it, in anticipation of the view that the courts may take, then it seems to me essential to the interests of the Government in this case, that there should be a full disclosure of the facts; and I do not wish that disclosure to go one iota further than seems to me to be necessary to safeguard the interests of the Government.

As the plaintiff in this suit, I have therefore made my position clear, as I undertook to do in the discussion of Dr. Volwiler's evidence, and, as unpleasant as it is to have to insist upon a posi-

tion which seems to me to be a sound legal one, I think my purpose is clear.

THE COURT: Are you through on both sides?

MR. KRESEL: I have nothing further.

THE COURT: Then I desire to ask you this question, Mr. Kresel: Do you contend that the specific patent here under discussion, or any of the dye patents so-called, used by this witness in his employment with the duPont Company are invalid?

MR. KRESEL: We make no such claim your Honor.

THE COURT: What use or what value in this case has the testimony from your standpoint, given by the witness?

MR. KRESEL: The value of it is to show that the value paid by the defendant for these patents was an adequate consideration.

THE COURT: That is, the ultimate price?

MR. KRESEL: That there were elements in connection with these patents which affected their value—let me put it that way—their commercial value.

THE COURT: The prices which could be obtained for them——

MR. KRESEL: Commercially.

THE COURT: Commercially?

MR. KRESEL: Yes, sir.

THE COURT: I assume from the sales standpoint it is commercial value only that is involved?

MR. KRESEL: That is my understanding.

THE COURT: Colonel Anderson, I may be wrong, but I think I am right. In principle there is no doubt about it in my mind. If technically I have erred, or I am about to err you are not without remedy. There are appellate courts which may correct any errors which I may make. In

the first place, I think this evidence if given, is irrelevant, immaterial and not pertinent to any issue in this case raised by the plaintiff or by the defendant. I failed to appreciate the irrelevancy and immateriality of such testimony when I made my statement with respect to the testimony of Dr. Volwiler the other day. I now decline to direct this witness to answer, and hold, for the first time in this case, that the testimony called for is irrelevant and immaterial and is not pertinent to the issues in this case; and I make the same ruling with respect to the testimony of Dr. Volwiler. Is your position with respect to the testimony introduced by him, the same as this?

Mr. Kresel: Exactly the same your Honor. I make no contention as to the validity of these patents.

The Court: I revoke the order with respect to Dr. Volwiler, and you have your exceptions. I decline to make public any answer or to place the trade secrets of any commercial enterprise, under the conditions here called for, either public or quasi-public property. You may elaborate your exception in any way that you desire, Colonel Anderson.

Mr. Anderson: In order to get the record clear, I submit to your Honor's ruling——

The Court: If for any reason in the statements made by you heretofore, which I think I understand, if they are not satisfactorily put on the record from your standpoint, you are at liberty to elaborate them now, of after the noon recess, as much as you like, so that you may be fully protected.

Mr. Anderson: I would like even more time as to the statements which precede, because there has been so much said, but in any event, at the

present time, I wish to say that it was my purpose, which I now offer subject to your Honor's ruling, to the end that my position may be clear, to examine the witness in detail as to each of the patents covered by the list of forty-two patents heretofore filed, with special reference to the variations, if any, from the processes therein named, and the extent of such variations, and the actual changes and methods employed, that would cover intermediates, temperature, quantities of ingredients, change of concentration and reaction and additional steps in operation, all of which he mentioned in his answer this morning. I recognize that the examination on each of those points would necessarily go directly up against your Honor's ruling, and therefore I do not want to ask the questions which I understand not to be the practice of this court, but merely except to your Honor's ruling generally.

THE COURT: I consider that statement as compliance with Rule 46.

MR. ANDERSON: Yes, sir.

THE COURT: I will give you that right. I am not precluding you now, Colonel Anderson from showing by such persons as you may desire, that these patents are workable and will produce a satisfactory result, and that they may be converted to commercial uses without the loss of time or the expenditure of money. Now then, it seems to me that is the relevant portion of this testimony which goes to the value of the patents and not to their validity. I fail to see how the particular steps which anybody is using in making the commercial product, are relevant or material to the issues here. It is a question as to what the results are when the patent is strictly followed, and what length of time is required by any person making

an honest endeavor to reduce it to commercial practice in order to do so, so that Dr. Volwiler need not return.

MR. ANDERSON: Will your Honor permit me a minute in view of that ruling?

THE COURT: Yes.

XQ. 400. Dr. Bolton, you spoke this morning, in connection with your opinion of commercial value, of the failure to have the know-how, as you call it, on these patents. What would you define as know-how? Instead of asking you specific questions, I will do an unusual thing and ask you a general question.

A. I would define the know-how as the chemical and the engineering knowledge necessary to produce these products at a commercial cost and of a requisite quality equal to the pre-war German prototypes.

XQ. 401. Would you regard experience as a valuable element in that know-how?

A. Experience is an element.

XQ. 402. And that experience would apply not only to the chemical processes and re-action but to the mechanical, and by mechanical I mean including machinery and methods of operating machinery, and engineering problems in the construction and operation of a plant; would it not?

A. I believe it would.

MR. ANDERSON: If your Honor please, there are two or three questions that I would want to ask here, which I am inclined to the view will come within your Honor's ruling, but they seem to me important and I would like to ask them.

THE COURT: In order that your record may be sufficiently specific, you may do so. And, Dr. Bolton, if the questions call for the disclosure of trade secrets and confidential communications—not so much confidential communications as trade

secrets—you may say so. If they do not, you may answer. You will be the one to determine that.

XQ. 403. I will ask you this general question and divide it up, if desired: The date on which the duPont Company began to produce and sell in commercial quantities each of the dyes or intermediates which you said were produced under the 42 patents in the list which you have filed.

THE COURT: Unless the witness point out to me how that is a trade secret, I shall direct him to answer.

XQ. 403. (Continuing.) I would like to have the date on which you began to produce each of those in a commercial sense.

THE COURT: Can you give that offhand?

A. It is pretty difficult for me to give information like that offhand.

By THE COURT:

XQ. 404. Does the answer call for any disclosure of trade secrets in any way at all?

A. I do not think that the date on which we began the manufacture would be considered a trade secret.

MR. ANDERSON: Of course, that is only introductory to other questions.

THE COURT: You can have that. Will you produce that after the noon recess?

THE WITNESS: I think I can get it ready by that time.

MR. ANDERSON: I would like that information; the answer to be inserted at this point, as I understand.

XQ. 405. Will you please state the amount of pounds of each of the dyestuffs or intermediates which you state are covered by the several patents in the list which you filed, produced and sold by the duPont Company by years from the date on which they began

to produce, as indicated in your answer to the preceding question, down to the 31st day of December, 1922.

MR. KRESEL: Now, whether the witness says that is a trade secret or no, and I am not inquiring about that now, I object to the question upon the ground that it is immaterial and irrelevant and can have no bearing upon the question of the value of these patents. If Colonel Anderson is willing to do it, I would like to have him point out in what way the value of these patents can be affected in view of the testimony of this witness, by showing how many pounds of a certain product the duPont Company sold each year.

MR. ANDERSON: Each of the products on each of the patents?

MR. KRESEL: Yes.

MR. ANDERSON: I think it is obvious, the amount of product produced under a patent is one of the best evidences of its value.

MR. KRESEL: But this witness has said they were not produced under the patents.

MR. ANDERSON: I have to take the testimony of the witness for my argument.

THE COURT: We need not discuss that. The question then is directed not to the witness's testimony that it took time and money in order to convert the laboratory experiment into a commercial enterprise, as I understand you, but is an indication of the license fees properly receivable by The Chemical Foundation from one of its licensees; am I right?

MR. ANDERSON: That is one of the indications, but it is also an indication of the value of the patents regardless of the license fees.

THE COURT: I am sorry; but I missed just the line of reasoning, Colonel Anderson, which you follow to reach that result.

MR. ANDERSON: The line of reasoning, which I can state in a sentence, there, is that the amount and value of material produced under any patent is an evidence of the value of the patent; that is all.

THE COURT: You have put in evidence, if I recall, testimony with respect to the gross income of The Chemical Foundation. Is it your purpose by this to show that that does not truly set forth the facts?

MR. ANDERSON: It might or might not disclose them. That would be one of the effects of this evidence. The second would be the amount manufactured under it. Whether it will confirm that, I cannot tell until I know the evidence, because I have never talked with this witness; but I do not regard that one kind of evidence of value excludes another kind of evidence of value. Value is a thing that you have got to draw from a thousand different sources. There are so many elements, and they are so intangible, that you have got to accumulate as many as you can around a fact, which is always in the nature of circumstantial evidence to establish a probative fact.

THE COURT: I do not see any reason for departing from the general rule with respect to that, without passing definitely upon its materialty.

XQ. 406. (Continued.) Can you give that information now, Doctor?

A. The disclosure of that information would give our competitors a very good idea of our capacity for production. That information is valuable commercial information which, of this class of products, is not even published in the report of the Tariff Commission. They consider it also as valuable commercial information which should not be divulged.

Mr. Kresel: May I say in that connection; if Colonel Anderson will permit me, that the information sought is information which the Tariff Commission does get from these concerns; gets it in a confidential manner; never publishes it; and the Tariff Commission has declined in this case to give the Government that information.

Mr. Anderson: It is forbidden by law to do it. I could not go there myself as Attorney-General of the United States and get it.

Mr. Kresel: That shows the confidential nature of it, your Honor.

The Court: So it is unless and until reversed. If it is information of that character, it comes within the former ruling. I did not appreciate the fact that it did, Colonel Anderson.

Mr. Anderson: I was afraid that it would, sir. Therefore I gave your Honor notice of it.

The Court: You had more information about it than I had.

Mr. Anderson: Yes. Now I will ask another question which I know comes within the ruling; but in order to get the record clear.

XQ. 407. Will you please give me a statement from your records, if you cannot remember, showing the value in dollars by years of the dyes and intermediates of each of the classes indicated on your statement filed this morning covering forty-two patents or licenses, from the date of the beginning of production on a commercial scale thereof by the duPont Company down to and including the 31st of December, 1922?

The Court: Before answering that, is there any reason, Mr. Kresel, (I am asking you not so much as counsel for the defendant, but because you probably can help me) why these disclosures, both as to this question and the preceding ques-

tion, should not be made now in the year 1923 for the years up to April, 1919? It seemed to me that that possibly might be divided into two classes, that prior to the assignment of the patent and the four years past, and that a disclosure of this information with respect to that period might be made.

MR. KRESEL: Personally, your Honor, if I had the deciding of it, I see no reason why that should not be given. Will your Honor permit me to make inquiry of the witness who, of course, in the last analysis, is the one whose opinion should be weighed; and if counsel can go on to some other branch of the inquiry and permit us to come back after recess, I should be glad to inquire.

THE COURT: While I am protecting trade secrets, I do not intend to protect them any further than is necessary.

MR. KRESEL: Certainly.

MR. ANDERSON: With that last question asked, I do not think I have any further questions on cross-examination.

MR. KRESEL: It is understood that we may have until the noon recess to determine the question that your Honor has asked me.

THE COURT: Yes, the two questions.

MR. ANDERSON: The two questions as to poundage and value up to 1919.

THE COURT: Up to April 10, 1919, if you want to.

MR. ANDERSON: April 1st would be just the same thing; easier to make up.

THE WITNESS: Your Honor, may I call your attention to the fact that on the vat patents we did not begin production until the fall of 1919; so it would be very difficult to make that division. We have not produced any prior to that time.

THE COURT: You have the complete answer, then, now. Does that answer open up a further field for cross-examination?

XQ. 408. You said vat patents. Were there any others, Doctor, than vat patents covered on the list that you filed?

A. I was calling his Honor's attention to the vat patents where we could not. There are a few other cases where we perhaps can.

XQ. 408a. Like sulphur black and things of that kind?

A. Well, sulphur black is not covered by these patents.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 409. Are there any patents on this list for which you hold licenses from The Chemical Foundation, which are patents for other than vat dyes? Will you just take the list and point out, giving the license number, because that is most convenient to handle, those which cover dyes that are not vat dyes?

A. License 331 covers an azo dye. License 177 covers a pigment. License 249 covers a sulphur dye. License 332 covers an intermediate, which is sold as a textile intermediate to the trade and they make the combination to form the color. License 334 covers a sulphur dye; 363, sulphur dye; 365, sulphur dye; 381, azo dye; 387, azo dye; 398, azo dye; 399, azo dye. All the others are vat dyes.

RDQ. 410. I understand your testimony to be that insofar as the manufacture of vat dyes is concerned, your company did not commence such manufacture until the fall of 1919, is that right?

A. That is correct.

MR. ANDERSON: Would you mind if I asked something else that has occurred to me?

MR. KRESEL: Certainly; go ahead.

THE COURT: Do you want Mr. Kresel to finish his thought?

MR. ANDERSON: Yes; and then I would like to ask one or two questions that occur to me.

RDQ. 411. But as to the others, the azo dyes and the sulphur dyes that you have just mentioned, there was production both prior to April, 1919 and thereafter?

A. I doubt, Mr. Kresel, whether there was any production at all on these products; but perhaps sulphogene Bordeaux was made before that time; my recollection is rather hazy.

RDQ. 412. Will you look that up between now and our reassembly this afternoon and let me have the information?

A. Yes, sir.

MR. KRESEL: All right, Colonel.

MR. ANDERSON: Just a few questions.

CROSS-EXAMINATION (Continued).

By MR. ANDERSON:

XQ. 413. Doctor, can you say from your knowledge of this subject who were manufacturing dyes in the United States, and the intermediates thereof, prior to 1919?

A. The National Aniline & Chemical Company, which is now the Allied Dye & Chemical Company, was the largest manufacturer.

I believe the Newport Chemical Company, which was organized a few years before that time, were manufacturing a line of products. The Grasselli Chemical Company had taken over the Bayer plants, which had manufactured a line of products. The Klipstein Company was manufacturing the Consolidated Color & Chemical Company.

I think they represent some of the largest ones; but my recollection is that there were somewheres between 80 and 90, or perhaps a larger number, of

manufacturers in the year 1919. In the year 1919 I believe that there must have been close to 100 manufacturers of dyes and dye intermediates.

XQ. 414. Which were the largest of those manufacturers? You spoke of the National Aniline.

A. The National Aniline & Chemical Company was the largest.

XQ. 415 Were any of the other constituents of the present Allied Dye & Chemical Company engaged in making intermediates at that time?

A. The Barrett Company had made intermediates.

XQ. 416. Any others that you think of?

A. The Semet-Solvay Company was manufacturing certain intermediates.

XQ. 417. And the Newport Company is located where?

A. At Carrollsville, in Wisconsin.

XQ. 418. Klipstein is located where?

A. Down in West Virginia.

XQ. 419. Klipstein had been manufacturing for some time, had he not?

MR. KRESEL: Manufacturing what?

MR. ANDERSON: Dyes.

A. I believe they were among the first to manufacture sulphur black in this country.

XQ. 420. They had been manufacturing dyes and intermediates?

A. Yes, sir.

XQ. 421. Was there not a firm of Schoellkopf and somebody that manufactured?

A. The Schoellkopf Company — Schoellkopf, Harford & Hanna, I believe, is the full name of the firm which was taken into the National Aniline & Chemical Company.

XQ. 422. The companies you have named were

the principal manufacturers of dyes and intermediates in 1918?

MR. KRESEL: 1919.

MR. ANDERSON: Well, I said before 1918.

MR. KRESEL: No, you said 1919.

MR. ANDERSON: I said before 1919 in my original question.

THE COURT: You are correct, but I did not understand the answer of the witness—whether he was confining his testimony to the time prior to January 1, 1919, or prior to January 1, 1920. I was going to ask that.

MR. ANDERSON: I will ask this question, if your Honor will permit me:

XQ. 423. Would your answer apply to the first day of January, 1919?

A. It would.

MR. ANDERSON: I think that is all, Mr. Kresel.

THE COURT: Was your last inquiry directed to the production of vat dyes or intermediates?

MR. ANDERSON: I said dyes and intermediates as a whole. I am very much obliged to your Honor for suggesting that question, because I would like to get the information fully.

XQ. 424. Who were manufacturing vat dyes in 1918, or January 1, 1919?

A. There was a very small concern located near Newark, New Jersey, purported to have made vat dyes at that time; but I believe that the first substantial production of vat colors in this country was made by the duPont Company.

XQ. 425. Does that embrace vat intermediates also?

A. Vat intermediates also. It was my recollection about the same time or shortly afterwards the Newport Chemical Company came out with certain vat colors.

MR. KRESEL: Shortly after what time?

THE WITNESS: Shortly after the marketing of the vat colors by the duPont Company.

MR. KRESEL: And the first time the duPont Company marketed any vat colors, I understood you to say, was in the fall of 1919.

THE WITNESS: The actual date of marketing I do not know.

MR. KRESEL: Well, that is one of the things that Colonel Anderson has asked for.

THE WITNESS: Yes.

MR. KRESEL: You will give us the exact dates.

XQ. 426. How about the Klipstein Company; did they not manufacture some of those?

A. I do not recall any vat dyes.

MR. KRESEL: We have Mr. Klipstein here and you will have an opportunity to inquire about that of him.

XQ. 427. Did not the Schoellkopf Company manufacture vat dyes?

A. They are not manufacturing any of the indanthrene series at the present time.

Q. 428. You do not know whether they did prior to the war or not?

A. I am quite sure they did not prior to the war.

XQ. 429. Prior to the first day of January, 1919?

A. Also prior to the first day of January, 1919.

RE-DIRECT EXAMINATION (Continued).

By MR. KRESEL:

RDQ. 430. Dr. Bolton, you testified on cross-examination there were certain patents covering methods for the manufacture of intermediates that enter into the manufacture of indigo. Do you recall that? You gave the number of one, you did not give the numbers of the others because you stated you did

not have them available. You were asked whether the duPont Company had taken licenses under that patent or those other patents, and I understood you to say that they had not. Is that correct?

A. We have not.

RDQ. 431. In manufacturing your intermediate for the production of indigo, even when indigo was still under a patent, did you follow a method adopted by yourselves or did you follow any method covered by these patents?

MR. ANDERSON: I will have to object to that, sir. If he is going to describe methods we will have to go into them. Of course, that is a pure conclusion, but if we go into it at all we will go into it fully.

THE COURT: I do not understand the purpose of the question either, Mr. Kresel.

MR. KRESEL: I am very glad to tell your Honor the purpose of it, and it depends on the purpose of the cross-examination. Your Honor will recall that earlier in this case Colonel Anderson made the claim that the amount of money realized by The Chemical Foundation under its licenses was not at all a true measure of the value of these patents, because, says he, the stockholders of this Chemical Foundation are being favored by The Chemical Foundation, that The Chemical Foundation is allowing them to use these patents without paying royalties. I anticipate that counsel for the Government in argument and in brief will base an argument upon this testimony in the cross-examination of this witness, namely, that there were patents covering these intermediates and that they did not pay any royalty—to substantiate that claim.

THE COURT: If you want it on the record

and it does not get us into the question which we passed a moment ago, you may take the answer, but unless there is evidence—I cannot found a decree on suspicion, it must be founded on evidence, as far as I am concerned. What I might consider evidence and what some other Court might consider evidence might agree or disagree. It seems to me your question possibly opens up the other question as to what process was followed and the protection of the trade secrets. I do not know whether that process is the same now as it was then. I think proper cross-examination under that question would require a full disclosure probably.

Mr. Kresel: Of course, I gather from what your Honor has said that, inasmuch as there is no evidence of what process they did follow and argument based on what I have anticipated would hardly be of any value, still——

The Court: You will have to take your own chances on that.

Mr. Kresel: I understand I have got to take that chance, and I am going to take it.

Mr. Anderson: By keeping quiet, your Honor will, of course, not understand that we acquiesce in any such position that the Government is estopped because, when the witness was on the stand and we had an opportunity to take the evidence I did not raise the issue. As to what we are going to get into before we get through with this case, I am going to say now that we are going to contend that the license fees returned to The Chemical Foundation are no true indication of the value of these patents, and that, in order to bring that question out it is absolutely essential to bring out the evidence which your Honor has ruled out. But we are not going

to reopen that argument. Whether we can make that contention in view of the present state of the record will be a question, but I do not want to have the contention made that I am estopped when the evidence is closed from bringing that question up.

THE COURT: You will not be estopped. You may be estopped from successfully making that contention.

Do I understand this witness' testimony to be that license fees are being paid to The Chemical Foundation for all of these products of this company manufactured under these 42 patents?

MR. ANDERSON: The witness so testified.

THE WITNESS: I testified that we had taken out licenses to cover all of these patents. Some of these patents you can't work, about ten of them.

THE COURT: I did not want to open up your testimony again, because it might prolong it unnecessarily.

MR. KRESEL: I think this much, your Honor, the witness should be permitted to say, and I will put the question.

RDQ. 432. The mere fact that you have, say, 20 or 30 licenses—I have not counted them—covering 42 patents, does that mean that you are paying royalties under each license?

A. We are paying royalties on each license covering the products which we are manufacturing today. Of course, you understand that some of these things are not on a manufacturing scale at the present time.

RDQ. 433. You are not really manufacturing?

A. We are not really manufacturing some of the products.

MR. KRESEL: I think that explains it.

MR. ANDERSON: I shall reserve the right to cross-examine on that point.

MR. KRESEL: All right. You may reserve it. I have no objection to your reserving it.

RDQ. 434. You were questioned about the experience of the chemists you employed. You testified yesterday that you got the best that the market would afford you, the best the universities would give you. You also said that you got some German chemists, is that right?

A. That is true.

RDQ. 435. And have these German chemists been working on the processes under these patents that you have testified about?

A. They are working on some of the products covered by the licenses.

RDQ. 436. And are working in the development of some of these indanthrene colors covered by the patents that you have testified about?

MR. ANDERSON: I object, sir. I think that this gentleman can testify without being led right straight along.

THE COURT: The question is leading.

MR. KRESEL: On re-direct, may I not do that?

THE COURT: No, your questions may not be leading on re-direct.

RDQ. 437. Have or have not the German chemists been working under any of the patents about which you testified yesterday?

A. They have.

RDQ. 438. Can you specify which?

A. They have worked on products covered by the following licenses: No. 249.

RDQ. 439. You are reading from Defendant's Exhibit, 262?

A. Yes, sir.

RDQ. 440. Go on.

A. 249, covering patent 892,455.

RDQ. 441. What product does that cover?

A. That is sulphogene Yellow G G.

RDQ. 442. Is that a vat color?

A. That is a sulphur color. They are working on the product covered by license 314, which covers United States Patent 956,348. The name of the product is Hydron Blue R.

RDQ. 443. Is that a vat color?

A. That is a vat dye. They have worked on the product covered by license 332. Under this license there are about ten patents.

RDQ. 444. You need not stop to mention them because the exhibit will show what they are?

A. DuPont Naphthanil AS and BS.

RDQ. 445. What is the nature of that dye?

A. That is an intermediate which is sold to the textile trade for producing the color on fibre. They worked on the patent covered by license 334, containing patent 818,980. The products are known as sulphogene Bordeaux G B and 5 B.

RDQ. 446. And are those vat dyes?

A. Those are sulphur colors. They worked on license 364, containing patent 904,809. The product is sulphogene ochre G, a sulphur color. They are working on license 364, covering patent 966,092, covering Hydron Blue G.

RDQ. 447. Is that a vat or sulphur color?

A. That is a vat dye. They are working on license 365, covering patent 1,165,531, which product is known as sulphogene brown R.

They are working on license 366, covering patent 1,243,171. The product is known as Sulphanthrene Pink F F. They are working on license 368, covering

patent 1,243,170. The product is known as Hydron orange and crimson. I do not know what else that patent covers.

RDQ. 448. Are those vat dyes?

A. They are vat dyes. They are working on license 381, covering patent 1,149,231. The products are known as Pontacyl Fast Light Yellow 2 G and 3 G.

RDQ. 449. Is that a vat dye?

A. Those are azo colors. They are working on the product covered by license 387. The patent number is 1,014,539. The product is Lithosol Bordeaux B. That is an azo color used in the lake industry.

RDQ. 450. What industry?

A. The lake industry.

RDQ. 451. I intended to ask you for a definition of that. You mentioned that on cross-examination, a lake in reference to color?

A. A lake is a color suspended on a substratum usually a combination of aluminum salt and barium salt. It is an insoluble product which is formed and used in the pigment or ink industries.

RDQ. 452. The lake is used mostly, insofar as color is concerned, in connection with the paint industry and the ink industry?

A. Yes.

RDQ. 452a. It is more a pigment than color, is it?

A. Yes; it is the color of an insoluble material.

RDQ. 453. I see. Will you proceed?

A. They are working on license 389, covering the following patents—856,811 and 876,810. The products are Pŏnsol Golden Orange and 2 R T.

RDQ. 454. What is the nature of this?

A. These are vat dyes.

RDQ. 455. Now, will you just give the number of the license, without stopping to give the number

of the patent, because it appears on the exhibit anyway, and just indicate the product that they cover?

A. License 398, covers Lithosol Vermilion G, an azo color. License No. 399—we do not have any name for this product at the present time.

RDQ. 456. They are not producing yet?

A. No. We are making an examination of this license at the present time, and no name has been assigned to this product by ourselves in the department. That is the list.

MR. KRESEL: Does your Honor desire to adjourn now?

THE COURT: At your convenience.

MR. KRESEL: Your Honor, I can be through with the witness in a very few minutes.

RDQ. 457. Can you indicate for how long a period these German chemists have been working on license?

A. They have been working on these products, on some of the products, since 1921.

RDQ. 458. You spoke of having taken out licenses from The Chemical Foundation in order to protect your consumers for the purposes you have described. Now, did you also take out licenses to protect yourselves, I mean the duPont people, where the patent was a product patent, whether you manufactured by the patent process or no?

A. We took out licenses for all patents covering the products which were manufactured, regardless of the method of manufacture.

RDQ. 459. You spoke of the steps of manufacture under cross-examination. You said from laboratory to factory. Is there or is there not an intermediate step?

A. There is an intermediate step which we call semi-works manufacture, that is, manufacture in

quantities of ten to perhaps as high as fifty pounds per batch, and that manufacture is carried out in miniature plants which are assembled for the purpose of getting all the chemical engineering information that is necessary for the process before it is tried on a large scale, and also for the purpose of training our chemists with the details of the operation.

RDQ. 460. In answer to one of Colonel Anderson's questions, you said substantially—I have not your testimony before me—but substantially there are other patents owned by The Chemical Foundation which have reference to the products covered by some of the patents about which you testified yesterday and this morning. Now, did I get substantially what your answer was?

A. Yes.

RDQ. 461. Now, please state how many such patents there are if you can, to what particular product they refer, and whether or no you took licenses thereunder, and if not, why not?—that is a little involved.

THE COURT: I think you had better answer that after the noon recess. Recess till 1 o'clock.

AFTER RECESS.

RDQ. 462. Dr. Bolton, since the recess I have obtained a copy of your testimony of this morning, and the question that I had been directing my last inquiry to before recess is this: I read from page 4105:

"XQ. 365. Doctor Bolton, are you prepared to testify of your knowledge that the patents which you have filed in your direct examination are all of the patents, among those assigned by

the Alien Property Custodian to The Chemical Foundation, which have any application to the manufacture of the dyes and intermediates manufactured by the duPont Company and stated on your list filed this morning?"

That was a question by Colonel Anderson. Your answer to that was, "They are not all the patents."

If there are other patents, I would like you to state what they are, what product they cover, and whether or no the duPont Company took licenses thereunder; and, if not, why not?

A. We have taken licenses from The Chemical Foundation on all products which are covered by patents owned by The Chemical Foundation. We are not manufacturing today any products covered by these patents owned by The Chemical Foundation for which we do not have licenses.

MR. ANDERSON: If your Honor please, I have to object to that question and move to strike out the answer on this ground: The question of what a patent covers calls for a conclusion. While I have not a doubt that the witness is convinced himself on that subject, and there is no suggestion that he is making any statement outside of what he is convinced of, in the last analysis that can only be arrived at by the method which I need not review but which is well understood. Therefore, I object to the question and I move to strike out the answer, as irrelevant and incompetent, if only for purely technical reasons.

THE COURT: Does that apply to the answer to your inquiry as well?

MR. ANDERSON: I beg your pardon, sir.

THE COURT: Does that apply to the answer to your inquiry also?

MR. ANDERSON: No. I think I have a right to put that inquiry and rest upon his opinion upon that subject. On cross-examination I asked him if there were any——

THE COURT: Won't you read me that inquiry by Colonel Anderson again?

MR. KRESEL: Yes, your Honor: (Reads XQ. 365, as recorded.)

MR. ANDERSON: A patent may have application to a certain process or a certain method, and I admit that that is a conclusion, which may or may not cover that process or method, because there may be variations from it. In other words, the witness might answer both those questions with entire accuracy, and yet it would leave the record in a condition where at least an argument might be made which was contrary to the actual facts of the situation. The one is a very much broader statement than the other.

THE COURT: In view of the interpretation of the question and answer in cross-examination, I do not see that there is any basis for the question on re-direct. Unless the Government's contention is that there is an inference from the answer that the witness' company is using some of these patents for which it is not licensed, I see no relevancy or materiality that a denial would have. I assume that was the purpose of your inquiry.

MR. KRESEL: That was my assumption, your Honor.

THE COURT: I understood from Colonel Anderson now it is not.

MR. ANDERSON: I did not so intend to interpret the answer, that there is no relevancy on that point. Surely, your Honor misunderstood me.

THE COURT: Then I misunderstood you. Won't you state it to me again, Colonel Anderson.

MR. ANDERSON: The patent, as I understand it, may apply to a certain process.

THE COURT: What do you mean by "apply"? That is where I misunderstood you.

MR. ANDERSON: It might apply to some phase of that process and not to the entire process. I made my inquiry just as broad as I could, if he knew of any patents belonging to The Chemical Foundation or which are claimed by The Chemical Foundation which had no application to the processes or products covered by this situation other than those in evidence, and he said there were others. The present question undertakes to have him say whether or not they covered the products or processes covered thereby. I think there is a distinction there. I used the word "application" in the broadest sense, since I did not want to limit it to patents which it actually covered, but which might have an application, and which upon a proper study and interpretation thereof would require licenses, although the witness might not think they did require licenses.

MR. KRESEL: I am perfectly willing, your Honor, to so amend the question as to use the same word "application."

THE COURT: The present question is withdrawn.

RDQ. 463. Now, I am asking you, Dr. Bolton, whether there are any patents which have any application to the manufacture of the dyes and intermediates manufactured by the duPont Company and stated on your list filed this morning, that are owned by The Chemical Foundation and that the duPont

Company was using, for which it had no license? Are there any such?

A. There are none, to the best of my knowledge.

RDQ. 464. I have a note that there was a question put to you this morning substantially as follows, as to whether the experience of chemists in the explosive industry is entirely different from that in the dyes industry. Substantially, that is my recollection of the question. Do you recall the question?

A. I recall it.

RDQ. 465. At page 4099, the question was this. I think I had better read the preceding question.

> "Did you not have a good deal of difficulty with your organization in the use of the intermediates which they had been accustomed to using in explosives, in getting them to apply these intermediates in an effort to secure a different result in dyes."

Your answer was, "I don't think so. Our aniline was of a good quality at that time. Our dimethylaniline was good. The diphenylamine was a purified product."

Then this question:

> "I did not mean that, Doctor. You had men trained in the production of explosives, as you said. Now, did you not have a good deal of trouble in untraining them and turning them into dye manufacturers with that organization? We are now discussing plant organization."

Your answer was: "It is an entirely different kind of experience."

Now, what is an entirely different kind of experience?

A. Most of the men who had had previous experience in the explosive industry had been trained in the

manufacture of products like smokeless powder and the raw materials which are used in the manufacture of smokeless powder. Those products are entirely different from the products which we were attempting to manufacture in the dye industry. It was experience with products in another field of organic chemistry which did not bear directly upon the work which they were doing in the dye industry.

RDQ. 466. Save you been able to obtain the dates when you started manufacturing these vat dyes as requested by Colonel Anderson?

A. I have.

RDQ. 467. Will you give them, please?

A. The manufacture of Ponsol colors was started on a commercial scale by the duPont Company on the following dates:

Ponsol Blue G D, November, 1919;
Ponsol Blue R P, October, 1921;
Ponsol Blue 3 G, November, 1922;
Ponsol Blue R, October, 1919;
Ponsol Yellow G, November, 1919;
Ponsol Dark Blue B. R, August, 1919;
Ponsol Green B, September, 1919;
Ponsol Violet R, October, 1919;
Ponsol Violet R R, December, 1919;
Ponsol Black B, December, 1919;

MR. KRESEL: I think that is all.

MR. ANDERSON: You may stand aside, Dr. Bolton.

(Witness excused.)

MR. KRESEL: If your Honor please, counsel on both sides have examined the transcript of the record of Professor Stieglitz's testimony in chambers. There are certain corrections that

have to be made therein, and Mr. Knight and I have agreed upon those. They are noted on this copy of the transcript that I shall now hand to the Stenographer, with your Honor's instruction to make those corrections.

THE COURT: Let the corrections be made, and Mr. Clerk, will you give the official copy to Mr. Smart, so that he can make them.

MR. KNIGHT: I would suggest, your Honor, that he make new copies rather than correct these, because there are quite a number of changes, and we can turn in the others.

THE COURT: I will leave that with Mr. Smart.

ERNEST H. KLIPSTEIN.

ERNEST H. KLIPSTEIN was called as a witness on behalf of the defendant, and having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Now, Mr. Klipstein, where do you live, please?

A. I live in Orange, New Jersey.

Q. 2. And what is your business?

A. Dyestuff and chemical manufacture.

Q. 3. And what is the name of your firm or corporation?

A. E. C. Klipstein & Sons Company.

Q. 4. Is that a corporation?

A. Yes.

Q. 5. Now, please state what your education and experience has been in the chemical line?

A. I studied chemistry for four years at Princeton, New Jersey.

Q. 6. Princeton University?

A. Princeton University, and a year at the University of Berlin, in Germany, and a year at Columbia University; and since 1915, until recently, I have been treasurer of E. C. Klipstein & Sons Company.

Q. 7. Has your Company made any experiments under any patents purporting to show methods of making synthetic tannings?

A. Yes. We started in 1918 to work under several patents licensed from The Chemical Foundation.

Q. 8. Licensed from The Chemical Foundation; now, have you copies of those patents that you took under license?

A. Yes, sir.

Q. 9. How many of them are there?

A. There are twelve, I believe.

Q. 10. Will you produce them and I will put them in evidence first.

A. Yes.

Q. 11. What did you say?

A. There are probaly three there that we have no licenses for.

Q. 12. Will you just segregate those that you have and those that you have not licenses for?

MR. KRESEL: Let me have that Exhibit No. 83, that big license sheet.

Q. 13. Now, have you got them separated?

A. Yes.

Q. 14. May I have them, please?

A. (Handing papers.)

Q. 15. You have handed me patent No. 1,336,759, Patent No. 1,237,405; 1,191,480; 1,216,612; 1,278,229; 1,232,620; 1,254,364; 1,133,108; 1,289,280; 1,281,494; 1,107,107—a total of eleven patents. You say that you had a license or licenses under those from The Chemical Foundation?

A. We have.

MR. KRESEL: I offer each of those, your Honor, as a separate exhibit.

Received in evidence and marked respectively "Defendant's Exhibits Nos. 263 to 273, inclusive." (*See Patent Exhibit Book.*)

Q. 16. Mr. Klipstein, in my previous question to you I spoke of synthetic tanning materials.

Are there natural tanning materials as distinguished from synthetic?

A. Yes, there are.

Q. 17. Are such natural tanning materials known by any particular names; what do you call them?

A. They are chiefly extracts of various woods, barks and nuts. Chestnut wood, for instance, makes an extract, and oak bark and quebracho.

Q. 18. What is the last?

A. Quebracho? That is the extract of a South American wood, which constitutes probably three-quarters of all the tanning material used.

Q. 19. When you are speaking and when I am asking you about tanning materials, you refer to tanning of what?

A. Tanning of raw hide.

Q. 20. In making leather?

A. That makes leather.

Q. 21. Prior to the outbreak of the European War was there any synthetic tanning material being used in the United States?

A. There was some used. It was being introduced.

Q. 22. Introduced from where?

A. From Germany.

Q. 23. Since your company took licenses such as you have described, from The Chemical Foundation, have you undertaken to produce any synthetic tan-

ning materials by following the steps outlined in any of these patents?

A. Yes.

MR. ANDERSON: I object on the ground that he may state what he did, but not the conclusion that he followed the steps in the patents. That is in addition to my general grounds.

MR. KRESEL: In addition to what?

MR. ANDERSON: In addition to the general grounds.

MR. KRESEL: What are the general grounds?

MR. ANDERSON: The general reservation to all this testimony, of immateriality, irrelevancy and incompetency, and for the further reason that you are estopped to raise these questions for the reasons stated yesterday. Those are the general grounds. I am applying those to all, but I make the specific objection in this case.

THE COURT: Is or is not that the same question which was propounded to the preceding witness? I thought it was the same.

MR. KRESEL: I have tried, your Honor, to make it as nearly the same as I could in language.

MR. ANDERSON: Very much the same question, perhaps, as was put to the witness this morning.

THE COURT: But yesterday.

MR. ANDERSON: The general questions put this morning were very much along that line, and I said I would waive——

THE COURT: No, you see there were inquiries with respect to eight patents yesterday, seven or eight, and your agreement only applied to a general question as to the meaning of thirty-four. This question is the identical question, as I recall it, that was put yesterday with respect to eight patents.

MR. ANDERSON: Each patent was taken up, and the question was asked the witness, and he took the process and followed the process, but he did not detail the process into the record, and then say he did those particular things.

THE COURT: Now, what is the question?

(Q. 23 read as above recorded.)

MR. KRESEL: Just say yes or no.

THE COURT: I understand Colonel Anderson's objection and I am going to sustain it. It is the one that was not fully disclosed, but I think you understand it.

Q. 24. Mr. Klipstein, I show you patent No. 1,336,759, and ask you to state whether your company undertook to manufacture synthetic nahpthalene condensation tanning material described in that patent, and whether or no you followed out the directions outlined in that patent?

THE COURT: That last part comes within the previous ruling. I may permit you to ask that question as to some of the patents after you have put the question in a different way as to one of those things.

MR. KRESEL: I will strike out of the question all after the words "described in that patent."

MR. ANDERSON: Then I understand the question merely calls for a yes or no answer, so I have no objection to its form.

Q. 25. Would you say yes or no?

A. Will you please read the question again.

(Q. 24 read as follows:)

Mr. Klipstein, I show you patent No. 1,336,759 and ask you to state whether your company undertook to manufacture synthetic naphthalene condensation tanning material described in that patent?

A. Yes, we did.

Q. 26. Please state whether, in making that attempt, you did or did not follow the steps described in that patent?

MR. ANDERSON: I will have to ask in this case that he state what he did.

THE COURT: At least for this patent. We will see if we can shorten it after that.

Q. 27. Please state what you did in attempting to make this material?

A. We first, of course, worked the reaction in the laboratory and found the description of the process in the patent fairly satisfactory; but as soon as we left the laboratory we had an entirely different problem to work out, and it took us about almost a year to make the material in a satisfactory manner and commercially salable.

Q. 28. Did you have a plant where this product was manufactured?

A. Yes, we did.

Q. 29. How large a plant did you build?

A. We built a plant large enough to make about a thousand barrels a year; about 2000 barrels a year.

Q. 30. And in pounds, what would that be?

A. That would be about a million pounds.

Q. 31. You say that in the plant you had, I think, to use your words, a different problem. What was it? What was the problem in the plant? How was it distinguished from what you found in the laboratory?

A. We found that the laboratory process was a total failure when put in the plant; and instead of getting the product we desired, the mass was usually very tarry and black and impure and required a great deal of filtration and purification, which was expensive, before we could market it.

Q. 32. Do you remember when you commenced these experiments and when you started your plant up?

A. We started the plant in the summer of 1918.

Q. 33. At that time can you tell what the natural tanning material was selling at?

A. The natural material sold at about 5 cents a pound.

Q. 34. What did it cost you to produce the synthetic material in the way that you have described by following the steps outlined in that patent that you now have before you?

A. Well, it cost approximately 8 cents a pound at that time, which was during the war period.

Q. 35. What are the chemical elements that are used in making this synthetic tanning according to that patent that you have before you?

A. Sulphuric acid, naphthalene and formaldehyde.

Q. 36. When you followed the steps outlined in that patent, what did you find with reference to the combination of those three chemicals?

A. We found that before we could manufacture the material successfully, it was necessary to devise a method of combining the chemicals to prevent the tarring and burning.

Q. 37. Well, when you followed the steps outlined in the patent, what was the result with reference to the chemicals combining?

A. Why, occasionally the whole mass would become solid and worthless, causing quite a loss.

Q. 38. How long did you say you continued research to develop this material under the patents?

A. We worked at it about a year and three months before we made a suitable material.

Q. 39. Is there anything in the patent as to how the formaldehyde is to be introduced into the mixture of chemicals?

A. No; the patent merely states to add formaldehyde.

Q. 40. Add formaldehyde without telling you how to do it or when to do it or under what conditions to do it?

A. It says to add in small portions, stirring vigorously.

Q. 41. Did you stir vigorously?

A. I stirred vigorously.

Q. 42. And did you add in small portions as you were stirring vigorously?

A. Very small.

Q. 43. And was this worthless mass that you have described the result?

A. Most of the time it was.

Q. 44. I show you patent No. 1,237,405. Please state whether you undertook to make the product described under that patent, and what is the name of the product; tell us that?

A. The name of the product?

Q. 45. Yes.

A. Why, the German name was neradol, and we made considerable quantities under this patent.

Q. 46. The one that we have just been discussing, 1,336,759, as I understood it, was a naphthalene condensation process?

A. Yes.

Q. 47. In addition to that, how would you describe the process under the patent that you now have before you, namely, No. 1,237,405?

A. In that a phenolic base is used.

Q. 48. Phenolic condensation process; is that it?

A. Yes.

Q. 49. Is it a correct deduction from the fact that it is called phenolic, that the drug phenol is used?

A. Yes, or analogous drugs—cresol.

Q. 50. What are the chemicals that enter into the

manufacture of the product under this patent that you now have before you?

A. Phenol or cresol, sulfuric acid and formaldehyde.

Q. 51. Please state whether or no in undertaking to manufacture under this patent you followed the steps therein outlined?

MR. ANDERSON: I think I have to object and ask him to say what he did.

MR. KRESEL: Strike out the question.

Q. 52. What did you do in attempting to make the product described under that patent?

A. We at first worked it in the laboratory.

MR. ANDERSON: What did you do in the laboratory? Say what you did.

A. (Continued.) Followed the description of the process mentioned in the patent.

BY THE COURT:

Q. 53. What Colonel Anderson wanted you to do was to specify the steps that you took in following, as you state, the process of the patent?

A. We took four pounds of phenol, four pounds of concentrated sulfuric acid, and heated the mixture at about 100 degrees Centigrade for about six hours, and then, after cooling, we slowly added with vigorous stirring the 900—or required amount of 40 per cent. formaldehyde solution.

By MR. KRESEL:

Q. 54. Having done that, what was the result that you obtained?

A. The result was a very good product, soluble,, and could be used for tanning silks or raw hide.

Q. 55. Was that the laboratory method that you have now described or the final method?

A. That was our experience in the laboratory.

Q. 56. Did you then undertake to manufacture commercially?

A. Yes, we did.

Q. 57. What did you do in that respect?

A. We first start in small lots of about 100 pounds and get our experience from observing in that quantity, and it was at that point where we had to spend a great deal of time on research and development to devise a way to keep the mass from burning itself. It seems that as soon as a certain temperature is reached the whole mass develops an enormous amount of heat and solidifies. It was quite a trick to keep the mass cool and stirred properly to prevent that from happening.

Q. 58. With respect to this patent that you now have before you, are there any directions therein as to the time when and the method how to introduce the chemicals into the vessel wherein the product is being made?

MR. ANDERSON: The patent speaks for itself. The interpretation of the patent is a question for the Court.

MR. KEESEL: I am not asking him to interpret; I am asking him to read what, if any, directions there are.

MR. ANDERSON: I think we are all capable of reading that. It is a written instrument, and speaks for itself.

THE COURT: I understand the objection; but I think the answer may have some value. You may take the answer.

A. The patent states to run the formaldehyde in slowly and cool the mixture to avoid rise of temperature.

Q. 59. Did you do as directed there? Did you run the formaldehyde in slowly and—what is the other part of it?

A. And cool the mixture to avoid rise of temperature.

Q. 60. And did you cool the mixture?

MR. ANDERSON: I would like to object, sir, on two grounds: First, it is a leading question, and second, he can ask him what he did and let the witness say what he did, and not counsel.

THE COURT: Directing the witness's attention to that particular operation, ask him what he did. The question as put is leading.

Q. 61. Did you or did you not run the formaldehyde in and cool it?

A. Yes, we did.

Q. 62. What result did you obtain?

A. Why, we obtained no practical results for two or three months.

Q. 63. Do not say that. I mean, what was the substance or mass or character of the stuff that you got?

A. Why, sometimes it was a very tarry, insoluble mass; sometimes it was a solid cake.

Q. 64. You spoke of the stuff burning. At what period of the process did you find that result?

A. At no given period. It would take place spontaneously without any warning.

Q. 65. Did you finally produce a tanning material described in patent No. 1,336,759, and a tanning material described in patent No. 1,237,405?

A. Yes, we did.

Q. 66. And did you produce a material that you could sell?

A. Yes, we did.

Q. 67. And did you sell it?

A. We sold a good deal of it.

Q. 68. Now, have you observed and do you know whether such material was used in the tanning of leather?

A. It was used.

Q. 69. And when used, what was the effect thereof upon the leather?

A. When used alone on rawhide, it produced a piece of leather which, however, was of no commercial value. It was generally used in connection with other tanning materials and then only in a very small way.

Q. 70. How have these synthetic tannings that you were able to produce, been used in tanning?

A. Why, we tried using them in every possible way. We tried to find a use for them.

MR. ANDERSON: I would prefer for him to say what use he made of them.

MR. KRESEL: He is going on to do that.

MR. ANDERSON: Not in every possible way, because I do not think he can speak on that subject. Let him say what he did do.

A. (Continuing.) We tried using it on all classes of leather, in almost all stages of the tanning processes.

Q. 71. And what success did you obtain?

A. Why, we obtained hardly any success of any kind.

THE COURT: Won't you get him to say?

Q. 72. Yes.

A. Most of our customers at first were very much interested in it, and we would get orders and quite large orders for testing purposes, and in 95 per cent. of the cases the material could not be found to have any merit warranting the paying of a fairly good price for it.

Q. 73. And did you get repeat orders, as called in the trade?

A. No. I do not believe we ever kept a customer.

Q. 74. Have you recently been able to sell any of the stuff?

A. No. We have sold none of this material since May.

Q. 75. Of this year?

A. Yes.

Q. 76. When you first started to make it, how much of the product did you send out, as you say, for testing purposes?

A. In the first year or so about a million pounds a year.

Q. 77. When did you start to finally put it out?

A. In the fall of 1918.

Q. 78. Now, what has been the amount of your sales this preceding year, for instance?

A. In 1922?

Q. 79. Yes.

A. About two hundred or three hundred barrels.

Q. 80. And that would be how many pounds?

A. That would be about one hundred thousand pounds.

Q. 81. Now, Mr. Klipstein, what was the cost to you of the research and experimental work under those tanning patents?

MR. ANDERSON: I object on the ground that no proper foundation was laid.

MR. KRESEL: You may ask him if you desire now. I stop right now to inquire whether he knows, or I shall do it if you prefer that.

Q. 82. Mr. Klipstein, do you know how much your company has spent in research work and experimentation under these tanning patents?

A. We have spent about——

THE COURT: No.

Q. 83. The question is whether you know?

A. Yes, I do know.

Q. 84. Now, what has been your personal touch with the work?

A. I was very much interested in it personally, probably more than anyone else in our firm.

Q. 85. What did you do in that work?

A. I conducted a great deal of the chemical work and some of the manufacturing and some of the selling.

Q. 86. What was your position with the company during this time?

A. I was officially treasurer of the company, but had a lot to do with the chemical side of it and of the routine work.

Q. 87. As treasurer would the expenditures of the company come under your supervision?

A. Yes.

Q. 88. Now, I shall ask you to state how much your company spent in research and experiment on these tanning patents?

A. We spent between five and ten thousand dollars in research and experiment.

Q. 89. What did you spend on plant?

A. About twenty thousand dollars.

Q. 90. And in sales effort?

A. We spent about ten thousand dollars a year for three years.

Q. 91. Mr. Klipstein, we have been discussing only two of these eleven patents. Have you studied the remaining nine of these tanning patents?

A. I have.

Q. 92. And are you familiar with the processes that are outlined there?

A. I am.

Q. 93. Has your company undertaken to utilize those patents?

MR. ANDERSON: I object, sir.

MR. KRESEL: Object to the word "utilize"?

MR. ANDERSON: Yes.

MR. KRESEL: I withdraw the question.

Q. 94. Has your company undertaken to produce under those patents?

MR. ANDERSON: I object on the obvious grounds.

THE COURT: Overruled.

A. No, they did not attempt to produce under these patents?

Q. 95. Why not?

A. A different reason for each patent. In some cases the materials were far too expensive, and in others the product was interesting mostly from a scientific standpoint. In others the machinery required to produce them would be far too expensive for such a cheap product.

Q. 96. Insofar as your examination and investigation of these eleven patents are concerned, did you select these two——

THE COURT: The question is leading.

MR. KRESEL: I will strike it out.

Q. 97. Why did you select the two, to wit., No. 1,336,759 and No. 1,237,405, out of the eleven patents?

A. Chiefly because the raw materials were available and fairly cheap.

Q. 98. Mr. Klipstein, does your company deal in the natural tanning?

A. Yes, they do.

Q. 99. How large a business does your company do in tanning materials, for instance?

A. It varies, but I should say it averages about between half and one million dollars a year.

Q. 100. Do you manufacture or sell any other kind of product than tanning materials?

A. Yes, we make dyes.

Q. 101. How large a business have you gentlemen down there, in total business per year?

A. I will have to correct myself. It is not this company that deals in the natural tanning materials; it is another company.

Q. 102. Which company is that?

A. A. Klipstein & Company.

Q. 103. Who is A. Klipstein -- any relation to you?

A. Why, he is the president of A. Klipstein & Company, and at this time my father, E. C. Klipstein, was the treasurer.

Q. 104. Of A. Klipstein?

A. Yes.

Q. 105. Counsel for the Government this morning mentioned Klipstein & Company as an old dye concern. Is that A. Klipstein & Company?

A. Yes.

Q. 106. Referring only now to your company, E. C. Klipstein & Sons Company, in addition to dealing in synthetic tanning materials—I understand you do deal in those?

A. Yes.

Q. 107. What other line of business do you follow?

A. We make dyes and intermediates.

Q. 108. Mr. Klipstein, basing your judgment upon your experience with these tanning patents, the results obtained therefrom, the market price of the natural tanning material and the cost of the synthetic tanning material as you have described it, what would you think about the value of these tanning patents?

Mr. Anderson: I object.

Q. 108. (Continuing.) What, in your opinion, are they worth?

Mr. Anderson: I object to that question on the ground that it does not appear that this witness is competent to express an opinion, and in

the second place, that the question does not accurately state the evidence or the basis from which an opinion can be predicated.

THE COURT: Do you mean those assumptions to be based on the testimony as given by him?

MR. KRESEL: Yes, sir.

THE COURT: That is not embodied in the question, I think. If you so limit it, I shall permit the answer. It is general as to the value of the ingredients and intermediates for the tanning material.

MR. ANDERSON: Exception.

A. Why, I would not think they were worth more than one or two hundred dollars.

Q. 109. Have you had occasion to examine the four additional tanning patents that are owned by The Chemical Foundation?

A. Yes.

MR. KRESEL: I offer in evidence four additional patents that I will describe as tanning patents, because it is already in evidence that there were fifteen of those, and I have only covered eleven. I want the whole line of them in. They are Nos. 1,203,069; 1,089,797; 1,421,722; and 1,414,045.

Received in evidence and marked respectively "Defendant's Exhibits Nos. 274 to 277," inclusive. (*See Patent Exhibit Book.*)

Q. 110. I had intended, Mr. Klipstein, when I asked you as to the reason for your not operating or licensing under any but the other two that you have described, to have included the entire fifteen. I shall, therefore, have to repeat my question as to these last four that I have just put in. Please state with reference to those four the reasons for your not operating or licensing those even?

A. Two of them were not issued until 1922, and

the other two, I think, called for intermediates or materials which were not available.

THE COURT: Does his answer as to value apply to the fifteen or to the eleven?

Q. 111. Mr. Klipstein, the Court's question is whether your estimate of the value applies to the eleven patents that you had under license or to the fifteen.

A. It would apply to all except the 1922 patents, which are new to me, and I could not estimate their value.

MR. KRESEL: Patent No. 1,421,722 was issued July 4, 1922, and Patent No. 1,414,045 was issued April 25, 1922. Those are the only two.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 112. Mr. Klipstein, when did you graduate in chemistry?

A. I graduated in 1912 from Princeton University.

XQ. 113. Where did you then go?

A. I went to the University of Berlin.

XQ. 114. When did you get through there?

A. I left there after spending a year there.

XQ. 115. So you left there in 1914?

A. 1913.

XQ. 116. When you came back to America, what did you do then?

A. I then took a year at Columbia University.

XQ. 117. Did you take a degree there?

A. No, I did not. I took special courses in chemistry there.

XQ. 118. When did you get through that course?

A. In June, 1914.

XQ. 119. Where did you go then?

A. I then went to a large cotton mill in the south.

XQ. 120. Where?

A. The Riverside & Dan River Cotton Mills.

XQ. 121. How long did you stay there?

A. I stayed there about a year.

XQ. 122. What position?

A. As a chemist.

XQ. 123. Chemicals?

A. Yes.

XQ. 124. In what connection with chemicals?

A. In the dye house, testing material and dyes.

XQ. 125. Dye testing materials?

A. Testing dyes and chemicals.

XQ. 126. You were one of the chemists in the plant there for that purpose?

A. Yes.

XQ. 127. How many did they have?

A. Why, they had some dyers but no other chemists.

XQ. 128. You say you stayed there about how long?

A. A year.

XQ. 129. Then where did you go?

A. I then went with the firm of A. Klipstein & Company.

XQ. 130. A. Klipstein & Company? Where were they?

A. New York.

XQ. 131. In what capacity?

A. Also as a chemist.

XQ. 132. Where were you located?

A. In their New York laboratory.

XQ. 133. And where are the New York laboratories?

A. On Greenwich street, New York.

XQ. 134. How many chemists are employed there?

A. They had about ten there.

XQ. 135. Ten chemists employed in the laboratory?

A. Yes.

XQ. 136. You stayed in New York in the laboratories, did you?

A. Yes.

XQ. 137. How long?

A. Until about the end of 1915.

XQ. 138. What did you do in the laboratory?

A. The war had just broken out and I spent most of the time testing dyes and identifying dyes.

XQ. 139. Identifying dyes?

A. Yes.

XQ. 140. Explain what you mean by identifying dyes, will you?

A. Why, they had a very large store of dyes which had become old and some of the records had been lost and those had to be rechecked and their identity discovered, so they could be sold.

XQ. 141. You mean you had to analyze them chemically in order to discover their identity?

A. No, it was not necessary to analyze them very accurately. A dyeing usually would tell what the dyestuff was.

XQ. 142. You say you kept that up until late 1915?

A. As near as I can remember.

XQ. 143. Where did you go then?

A. I then remained at that office and took up the work of managing the new company of E. C. Klipstein Sons Company.

XQ. 144. Organizing the new company?

A. Yes.

XQ. 145. What did you do in connection with organizing the new company; I mean, was your work financial, clerical or what?

A. Why, it became largely financial.

XQ. 146. When did you finish organizing the new company?

A. What did you say?

XQ. 147. When did you finish organizing the new company; when did the new company start business?

A. April in 1916.

XQ. 148. Now, where was the plant of A. Klipstein & Company that you had been connected with, where was their manufacturing plant?

A. Why, they did not have a manufacturing plant.

XQ. 149. What were they, importers?

A. Yes.

XQ. 150. Purely importers?

A. Yes, importers and merchants.

XQ. 151. Importers and merchants, dealing in dyestuffs and chemicals, is that it?

A. That is right.

XQ. 152. You organized this new company in 1916?

A. Yes.

XQ. 153. What did they do?

A. They started the manufacture of sulphur black.

XQ. 154. Where? Where was the plant?

A. In Rahway, New Jersey.

XQ. 155. Where was your office?

A. My office was in New York.

XQ. 156. You were at the head office of the company in New York, the administrative office?

A. Yes.

XQ. 157. A plant was out at Rahway, New Jersey, but have they any other plant that you know?

A. Why, A. Klipstein & Company was connected with another plant at Edgewater, New Jersey, and I had quite a lot to do with the chemistry and production at that plant at the same time.

XQ. 158. What do you mean by "quite a lot to do." Where was the laboratory of your plant?

A. The laboratory was at Edgewater, New Jersey.

XQ. 159. Where was the laboratory of the E. C. Klipstein Company?

A. Why, they had theirs at Rahway, New Jersey.

XQ. 160. Well, now, yiu said your office was in New York?

A. Yes.

XQ. 161. Did you do any chemical work in New York?

A. Yes, quite a lot.

XQ. 162. Where? In what position?

A. Why, I did some research work, experimental chemical work.

XQ. 163. Where did you do it?

A. In the New York laboratory.

XQ. 164. The New York laboratory, the same place you are talking about at Greenwich?

A. Yes, sir.

XQ. 165. What was your position with the new company?

A. My position was treasurer.

XQ. 166. Treasurer. Did you handle the finances of the new company?

A. Yes.

XQ. 167. What was its capital stock?

Mr. Kresel: How is that material, your Honor. I object to that as immaterial and irrelevant.

Mr. Anderson: It is a matter of publicity. It may be immaterial and irrelevant, but I do not think so.

Mr. Kresel: I know, but neither my thought or your thought is going to govern this. I am putting it up to the Judge.

The Court: Upon that basis I will have to

sustain the objection, or ask you to point out wherein it is relevant.

MR. ANDERSON: This gentleman is engaged in various lines of business. I want to see what was the size of the business of which he was treasurer, and what time was devoted to these various elements of his business.

THE COURT: I do not think the time he spent in research work is determined by the amount of capital stock.

MR. ANDERSON: By the size of the company. He is handling a certain amount of capital.

THE COURT: I do not think that is the way to get it, Colonel Anderson. It won't help me.

XQ. 168. What was the annual business of the E. C. Klipstein & Company in 1917, for instance, approximately?

A. About a million dollars.

XQ. 169. What was it in 1918?

A. About the same.

XQ. 170. You were still treasurer?

A. Yes.

XQ. 171. What was it in 1919?

A. It ran between eight hundred and a million nearly every year.

XQ. 172. Between eight hundred and a million?

A. Yes.

XQ. 173. You said half a million and a million a while ago?

A. I was speaking of the tanning material business of A. Klipstein & Company.

XQ. 174. Of A. Klipstein & Company?

A. Yes, sir.

XQ. 175. Which one is doing the tanning material business—A. Klipstein & Company?

A. Yes.

XQ. 176. Not E. C. Klipstein & Company?

A. E. C. were manufacturing.

XQ. 177. They were manufacturing what?

A. Synthetic tanning, and A. Klipstein & Company were selling it.

XQ. 178. And you were the treasurer of E. C. Klipstein & Company?

A. Yes, sir.

MR. KRESEL: A. Klipstein & Company were selling what, natural or synthetic?

THE WITNESS: Both.

XQ. 179. Were there any other duties you had except as treasurer?

A. No particular duties, no.

XQ. 180. Where were these experiments that you spoke of, where the tanning material was made?

A. Some of them were made at the New York laboratory, some in the factory at Edgewater, and some at a leather chemist's laboratory in Newark.

XQ. 181. Who made them?

A. A man named John Yokum was connected with it, and I myself did some of the work; and then we had one other chemist working on these materials.

XQ. 182. How old was John Yokum?

A. He was about forty-five or fifty.

XQ. 183. What had been his experience before that?

MR. KRESEL: Colonel Anderson, I forgot to ask him his age. I would love to have it on the record. Will you ask him, please?

MR. ANDERSON: Certainly. This gentleman's age?

MR. KRESEL: Yes, please.

MR. ANDERSON: If he does not mind telling it, he can tell it now.

THE WITNESS: Thirty-three.

XQ. 184. What was John Yokum's experience before he began to make this synthetic tanning material?

MR. KRESEL: Did you have Yokum's age?

MR. ANDERSON: Forty-five. I think he said.

MR. KRESEL: That is very important, I am sure.

MR. ANDERSON: Yes, I think so.

THE WITNESS: Forty-five or fifty.

XQ. 185. What had he done before?

A. Why, he had been a leather chemist practically all his life.

XQ. 186. What was the experience of the other man that helped him?

A. He had been a chemist and he had also been employed in the analysis of tanning materials.

XQ. 187. How long had he been employed in the analysis of tanning materials?

A. I could not say. Probably five or six years.

XQ. 188. Do you know?

A. No, I don't.

XQ. 189. How long had he been connected with E. C. Klipstein & Company.

A. Why, not until we went into the manufacture of synthetic tanning materials.

XQ. 190. And that was in 1917?

A. 1917 to 1918.

XQ. 191. You had had no experience in the practical manufacture of synthetic tanning material until this work was begun, had you?

A. No, I had not.

XQ. 192. Had the E. C. Klipstein Company had any experience in the practical manufacture of synthetic tanning material? I am not speaking now of natural.

A. No, they had not.

XQ. 193. Did you have in your employ, so far as your own knowledge goes, any person who had ever engaged in the industrial manufacture of synthetic manufacturing materials?

A. No, we had not.

XQ. 194. So that you and your company took up this matter as an entirely new venture, did you not?

A. We did.

XQ. 195. And I understood you to say that in the year 1918 you sold about a million pounds of this tanning stuff?

A. Yes.

XQ. 196. This synthetic tanning material?

A. Yes.

XQ. 197. Manufactured under these patents?

A. Yes.

XQ. 198. Turning now to Patent No. 1,336,759, you testified that it was first tested out in a laboratory; is that right?

A. Yes, it was.

XQ. 199. At what laboratory?

A. At our own laboratory at Greenwich Street, and also at Newark.

XQ. 200. And you testified that you got a very good result in the laboratory from following the patent?

A. Yes.

XQ. 201. The material was satisfactory, was it, that you produced in the laboratory?

A. Yes.

XQ. 202. The yield was satisfactory in the laboratory in proportion to the amounts of ingredients employed?

A. Yes.

XQ. 203. And you followed strictly the methods of the patent, did you not?

A. Yes.

XQ. 204. You had to construct a new plant, however, when you started to make this stuff industrially, did you not?

A. Yes, we did.

XQ. 205. And there was not a man connected with it that ever had any experience in making this stuff industrially, was there?

A. No, but the——

XQ. 206. Now, that is all; you have said "No."

A. (No answer.)

XQ. 207. Who had charge of the manufacture industrially of this synthetic tanning material under the patent to which I have referred?

A. The assistant to Mr. Yokum, who was a chemist.

XQ. 208. He was a chemist that you said you did not know how long he had been employed in this work, did you?

A. No, I don't.

XQ. 209. Did you have any trouble with your machinery in making this stuff?

A. No.

XQ. 210. Worked all right, did it?

A. The machinery worked all right.

XQ. 211. But you did not get the results when you started to manufacture commercially that you had gotten in your laboratory, is that right?

A. No, we could not seem to get the reaction.

XQ. 212. Take that patent, and look at example 1. Isn't that a rather complicated chemical process?

A. No, it is an extremely simple one compared to some.

XQ. 213. It is an extremely simple process, is it?

A. Yes.

XQ. 214. And you did not have any trouble at all in the laboratory in working that process out, did you?

A. Very little.

XQ. 215. And getting a satisfactory result?

A. Yes.

XQ. 216. When you went to manufacture, you found your stuff heated, did you not?

A. We found it decomposed for some reason or other.

XQ. 217. Are not the chemicals involved in that operation chemicals which, when combined, do heat themselves a good deal?

A. Yes, they do.

XQ. 218. And it requires quite a technique to handle those chemicals without getting undue heat, does it not?

A. Well, not this patent. The other one does.

XQ. 219. How about this one?

A. This one heat has to be added to it.

XQ. 220. And in your manufacturing you did not get satisfactory results?

A. No, not at first.

XQ. 221. But you did finally develop a satisfactory product, did you, and sold large quantities of it?

MR. KRESEL: He did not say a satisfactory product; he said a satisfactory process.

XQ. 222. All right. You did finally get a satisfactory result, did you?

A. Yes, we did.

XQ. 223. And you then produced a product under this patent which you sold on the market in large quantities, did you not?

MR. KRESEL: I object to that. Just contrary to the witness's testimony. He did not say he got it under that patent.

MR. ANDERSON: I am asking him a question, if your Honor please. I am not undertaking to recite his testimony. I am asking him a question.

MR. KRESEL: I beg your pardon; I thought you were repeating his testimony.

MR. ANDERSON: No, sir, I was not repeating his testimony.

THE COURT: Objection withdrawn?

MR. KRESEL: Yes, certainly; it is up to the witness.

XQ. 224. I asked you the question if you did not produce large quantities of that stuff, whatever you call it, tanning material, covered by that patent, and sell it on the market?

A. We produced quantities, but not large in comparison to the tanning material consumption.

XQ. 225. What is the tanning material consumption in the United States?

A. Why, I have no idea of it exactly; but it is many thousand times greater than the amount of this material which we sold.

XQ. 226. Approximately what would you say in millions of pounds or tons? Approximately what is it?

A. Probably runs about 100,000,000 pounds a year.

XQ. 227. Is it not a fact, Mr. Klipstein, that the natural tanning material such as chestnut and others that you spoke of, are becoming quite scarce in the United States?

A. They are growing scarcer in each year.

XQ. 228. As a matter of fact, chestnut was formerly the chief source of that material, was it not?

A. No, I believe hemlock was.

XQ. 229. Chestnut was a large source, however, was it not?

A. It is now.

XQ. 230. The chestnut forests are disappearing, are they not?

A. I could not say whether they are or not.

XQ. 231. Which of the examples set forth in that patent did you personally try? I am speaking now of the same patent I mentioned above, Defendant's Exhibit No. 263.

A. I tried the first example.

XQ. 232. You did not try the other two?

A. It is so long ago I cannot remember whether I did or not.

XQ. 233. Did you personally supervise the manufacturing process or development under either?

A. Yes, I did.

XQ. 234. You mean you went down? Where was that done?

A. That was in Edgewater, New Jersey.

XQ. 235. Did you go down there and stay there while all this experimentation was going on?

A. Yes, I did.

XQ. 236. And you supervised this work yourself?

A. Yes.

XQ. 237. And though you had gotten good results in the laboratory, you could not get any results in the manufacturing?

A. Not at first.

XQ. 238. But you did get them afterwards?

A. Yes.

XQ. 239. Now I will ask you to take that patent and say exactly what you did in getting the results. You said you followed the patent accurately in the laboratory?

A. Yes.

XQ. 240. I will ask you to state exactly what variation you made in manufacture from the patent, stating what the patent calls for and what you did?

MR. KRESEL: If your Honor please, I think the witness is entitled to be told at this point, that he is under no obligation, under your Honor's ruling, to state any inventions that he made or any trade secrets that are his in connection with the development of this process. If your Honor will hear the question read, you will see the pertinency of my remark.

THE COURT: Will you read it, please.

(XQ. 240 repeated as above recorded.)

THE COURT: You mean, to make the synthetic tanning material successfully?

MR. ANDERSON: Which he says he sold in large quantities in the market. In other words, if your Honor please, the testimony is that he made entirely successful work in the laboratory. Then he went to manufacture and he did not get satisfactory results. I want to know exactly what he did which was different from the patent process which he had followed in the laboratory, in order to get commercial results in the factory.

THE COURT: You are asking him for the methods that he devised which were different from those specified in the patent, to enable him to get a successful result in the works?

MR. ANDERSON: I do not know whether they were different at all or not, sir. I want to know exactly what he did, in order that we may see whether there is any difference.

THE COURT: I do not care how he got his successful product, if he did. It is not relevant or material, nor am I going to have him disclose it if he claims the privilege of trade secrets. With that ruling, you may take such action on the record as you wish.

By THE COURT:

Q. 241. Do you object on the ground of trade secrets to disclosing the information called for by Colonel Anderson's question?

A. Yes, sir.

MR. ANDERSON: Then your Honor sustains the objection to the question on the ground stated.

THE COURT: No, I do not sustain any objection. I advise the witness that he need not answer unless he wants to.

MR. ANDERSON: (To witness) What do you want to do?

THE COURT: He said that he claims the privilege.

MR. ANDERSON: I note an exception, if your Honor please.

THE COURT: Colonel Anderson, I wish you would tell me once more, so that I may make sure that I have your contention. I do not mean generally, Colonel Anderson——

MR. ANDERSON: I am trying to answer specifically.

THE COURT: I did not put the question.

MR. ANDERSON: I beg your pardon, I thought you had.

THE COURT: And that is—how the persons interested in these patents as licensees or otherwise can escape the dilemma of having their business destroyed if your contention be sound I thought I understood you this morning, but I am afraid I did not, because it continued over during the noon recess. It seemed to me I could not get it and I want to make sure I have it.

MR. ANDERSON: I recognize that the situation is one of some embarrassment, but my position, as briefly as I can possibly state it, is this: That the defendant which we contend is nothing but the agent for holding these patents for the benefit of its stockholders, among them, this gentleman and his company, acquired the patents from the Government of the United States in a method which has already been disclosed. The Government claims that the transaction is invalid for reasons among others, if we reach that—that there was an inadequate consideration.

THE COURT: For the purposes of this inquiry,

we will consider that the only allegation in the bill.

MR. ANDERSON: Very good, sir, for that purpose only. Now, the question of consideration therefore becomes an immediate issue. We come in to show that these patents have been issued, that they are yielding large revenues or have yielded and are yielding large revenues. They have been licensed for use under a charter obligation, as claimed here, to defend and protect the users thereunder, and the benefits thereof. We come in and show that large amounts of stuff have been manufactured under those licenses, under those patents, and to a certain extent at least, license fees are being incurred. Very good. The defendant comes in and says: That is all true, but those patents are not as valuable as you think they are, because the processes are not as well developed therein or shown therein as they should have been, while we admit they are varied, they might have been better, and it requires a great deal of money to put them in operation, and we have to vary or develop those processes into manufacturing and commercial results; and in order to get commercial results, we had to materially vary and improve those processes. Therefore, if you were out to determine the actual value by an accounting suit, there would be an apportionment of value under that variation. That is the theory; and your interests, that is, the interests of the seller, is reduced by the extent of that variation. I take it that is the object.

I say very good. How much did you vary them? What did you do? I would like to see what you have done. They say:—Oh, no, I cannot stand examination on that, because I disclose trade secrets. I come into court voluntarily, I am not

summoned to testify that they are not any good, but when you ask me what I did to make them good, I say—no, I do not have to say that, because that is disclosing trade secrets, and you cannot cross-examine. I say, if your Honor please, if that is the law, and your Honor so holds, and the Court sustains it, the Government of the United States bows to it with all deference; but in our view, it would be most mischievous and dangerous doctrine. Your Honor has my position as clear as I can state it.

THE COURT: No, you have not, Colonel Anderson, because, if I understand, you have not discussed my question at all. You have been interesting, but not instructive, because the specific question that I asked was this, Colonel Anderson: how these people, if they are the agents of The Chemical Foundation or The Chemical Foundation is their agent, can escape destruction as a result of a suit of this character, whether the belief of the Government is well founded or not. Because, if successful, that would be destructive of their business. If unsuccessful, if in the progress of the trial they are compelled to disclose trade secrets, which they testify they have spent years and thousands of dollars to develop, and those trade secrets if disclosed would go out not only to competitors in this country, but competitors abroad—that would be destructive of their business. So that the mere institution of a suit, whether well-founded or not, as I see it, would be destructive of the interests which the persons come in here to defend. There is my difficulty.

MR. ANDERSON: I think they should have considered that when they made the particular defense.

THE COURT: That is, the Government's position is——

MR. ANDERSON: They opened the door.

THE COURT: They make a defense at their peril?

MR. ANDERSON: No, sir. I think they can make a defense, but they cannot make a defense which involves an issue and put themselves into this position, where that defence involves the issue of the method of use of these patents, of taking advantage of that defense without its burdens. And while it may involve some little individual sacrifice, if they make the defense they must take along with the benefits of the defense its burdens.

THE COURT: Just how far can they go in making a defense without opening themselves to the danger of disclosing trade secrets? I have not been able to find a dividing line.

MR. ANDERSON: I think that would require a very careful consideration of each individual case, sir; and I would not like to try to answer that. While I am quite glad to render any assistance to the Court that I can, I do not know that it is my problem. I think it is more the problem of the defense.

THE COURT: Well, I will not press it.

MR. ANDERSON: I will render any assistance I can, but I have not considered just how far they can go.

THE COURT: Whether the process they employed is the same process or another process, whether it is the original patented process adapted to commercial conditions, or whether it is a modification of that process, but still considered as being within the patent, I think the materiality of the evidence ends with the disclosure that it is commercially unworkable without other infor-

mation; and to get the additional information that was required, whatever was required, in each particular instance, what they eventually developed is immaterial.

You may show in rebuttal, if you like, that those patents are workable commercially without any expense of time. I am satisfied with the ruling.

MR. ANDERSON: I am perfectly willing to proceed under it.

THE COURT: I just want to get your position to check up my own ruling on it. I have done that. Thank you very much, Colonel Anderson.

XQ. 242. Taking patent No. 1,237,405, which I understood you to be was a phenolic condensation, you stated on your direct examination that in your laboratory experiment in testing this formulæ you obtained a very fine product?

A. A satisfactory product.

XQ. 243. You stated a fine product?

MR. KRESEL: He did not say "fine product".

MR. ANDERSON: All right. Let us get the evidence on that. If there is a question on that we will go to the evidence.

(Here a short recess was taken at the direction of the Court.)

XQ. 244. Mr. Klipstein, I find we were both wrong. Your answer was, "The result was very good, soluble, and could be used for tannning silks, and raw hides." I said it was "very fine" in my notes and you said "satisfactory," so we will compromise on "very good". You stated that when you went to manufacture that product you could not keep it from burning itself, was that correct—under Patent No. 1,237,405?

A. Is that the phenol?

XQ. 245. Yes, the phenol?

A. It produced a lot of tar from the heat of reaction or some destructive reaction.

XQ. 246. It had a heated reaction?

A. Yes.

XQ. 247. You subsequently did produce and sell that product in considerable quantities, did you not?

A. Yes.

XQ. 248. And you paid under the Federal Trade Commission license the license fees required by that license thereon, did you not?

A. Yes, we did.

XQ. 249. And the same applied to the stuff manufactured under the other patent which we discussed?

A. Yes.

XQ. 250. In fact, all the synthetic tanning material which you have manufactured was manufactured under these patents, was it not?

A. It was.

MR. KRESEL: Do you mean under these licenses?

XQ. 251. Licenses under these patents, to be more accurate, as counsel suggests.

A. Yes.

XQ. 252. And you paid license fees in accordance with the terms of the licenses on all of this material did you?

A. Yes, we did.

XQ. 253. And you are still doing so?

A. Yes.

XQ. 254. Where you are manufacturing or selling?

A. Yes.

XQ. 255. You stated that when you produced this material it was not satisfactory as a tanning material without combining it with other or natural tanning materials; is that true?

A. No, we never tried to use it by itself.

XQ. 256. You used it in combination with natural tanning materials?

A. Yes.

XQ. 257. What did you find lacking in the patent No. 1,237,405, that you supplied in making the stuff that you sold?

THE COURT: Doesn't that call for the same thing that we have discussed?

MR. ANDERSON: I should think probably it would. Possibly, your Honor, it would call for that. Therefore, you are at liberty, Mr. Klipstein, under the Court's ruling to answer or not to answer that question, as you may desire.

THE WITNESS: I prefer not to say.

THE COURT: That is on the ground of trade secrets, if that will disclose trade secrets, because that is the basis of my ruling.

THE WITNESS: Yes.

MR. ANDERSON: Yes, your Honor.

THE COURT: If answering that question will disclose information that is a trade secret with your company, then you need not answer it.

THE WITNESS: Your question was——

XQ. 258. What did you find lacking in the patent that you supplied in your final manufacture, industrial manufacture—it calls for both a statement of what you found lacking and that which you supplied?

A. We had to do a little more than simply add the materials. We had to devise a special means of bringing about that reaction which was not described in the patent.

XQ. 259. Now, I will have to ask you what that means was, and subject to the same condition which the Court has stated?

MR. KRESEL: You understand you are not required to answer under the Court's ruling if to do so would reveal a trade secret.

A. I will not describe the process.

XQ. 260. You will not?

A. No.

XQ. 261. That what you did applied solely to the manufacturing under the patent in your laboratories?

A. Yes.

MR. ANDERSON: I will, of course, note an exception to the ruling.

THE COURT: Yes, an exception may be noted.

XQ. 262. You began to sell this material about the fall of 1918?

A. Yes.

XQ. 263. You were then manufacturing under Trade Commission license?

A. Yes, sir.

XQ. 264. Have you ever surrendered your Trade Commission license and taken a license from The Chemical Foundation?

A. Yes, we did.

XQ. 265. Your company is a stockholder of The Chemical Foundation, is it not?

A. It is.

XQ. 266. You are not here under subpœna, are you; when I mean subpœna, summoned by the Court?

A. No, I am not.

XQ. 267. You are here by the instructions of your company, your superior officers?

A. I am the president, so I am appearing without instructions.

XQ. 268. What was the sales price of this stuff per pound that you sold in 1918 and said you sold over a million pounds that year?

A. Not that year, the first year of our operation we sold a million pounds.

XQ. 269. The first year of your operation—what year was that, from 1918 over to 1919?

A. Yes.

XQ. 270. You sold about a million pounds; what was the price per pound, do you recall?

A. It was about seven cents net.

XQ. 271. Could you state the amount of the profits of your company from these synthetic tanning materials, taking the whole operation?

A. The whole operation just about paid for our plant and our research work and development work.

XQ. 272. Development work including the operating expenses of the sales organization of $10,000 a year that you estimated?

A. Yes.

XQ. 273. So that your plant was paid for and all of your research and preliminary work paid for out of the profits of the operation; is that true?

A. Yes.

XQ. 274. Is your company engaged in the manufacture of dyes and intermediates now?

A. Yes, it is.

XQ. 275. Under license from the Federal Trade Commission or from The Chemical Foundation?

A. Not at the present moment.

XQ. 276. What do you mean by "the present moment"? Do you hold any licenses?

A. We hold licenses, but we are not operating under them.

XQ. 277. You are not operating under those licenses.

A. No.

XQ. 278. What are you manufacturing now?

A. We are manufacturing sulphur black, anthraquinone and anthraquinone intermediates and one or two other sulphur colors.

XQ. 279. Are any of these colors manufactured under processes provided in patents under which you hold licenses, do you know?

A. No, they are not.

XQ. 280. Licenses for how many patents have you? Do you know?

MR. KRESEL: Do you mean dye licenses?

XQ. 280. (Continuing.) Yes, dye patents. Do you recall?

A. Licenses or patents?

XQ. 281. I mean, how many patents have you licensed to you from The Chemical Foundation or the Federal Trade Commission; do you recall that?

A. We have the hydron blue patents. I think there are three of them. And we have chrome black patent.

XQ. 282. Have you ever operated or produced under those patents?

A. We made a few thousand pounds of each, but never got into a profitable business.

XQ. 263. Never got into a profitable basis?

A. No.

XQ. 264. And you have never, I believe you said, examined the later patents, the very recent patents, on tanning material?

A. No, I have not.

MR. ANDERSON: I think that is all I want to ask.

MR. KRESEL: That is all, Mr. Klipstein.

(Witness excused.)

THEODORE W. SILL

THEODORE W. SILL, called as a witness in behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Please give your full name?

A. Theodore W. Sill.

Q. 2. And your residence?

A. Orange, New Jersey.

Q. 3. And your business?

A. Chemical manufacturing.

Q. 4. With what firm or corporation are you connected?

A. E. C. Klipstein & Sons Company.

Q. 5. Is that the same corporation with which the preceding witness is connected as president?

A. It is.

Q. 6. What is your position in the company?

A. I am treasurer of this company, as well as general superintendent of operations.

Q. 7. What has been your scientific education, Major?

A. I am a graduate of Princeton University in the Class of 1911. I have taken some courses at Pratt Institute; and otherwise my experience has been practical in twelve years of operations.

Q. 8. Operations of that nature?

A. In chemical manufacturing and executive direction of business—chemical business.

Q. 9. With what firm have you been connected before you became treasurer of this corporation?

A. The only firm with which I have ever been connected has been the Bulls Ferry Chemical Company, of which I was manager, and when E. C. Klipstein & Sons Company was formed, I diverted my attention to them.

Q. 10. What business was this other chemical company in that you have mentioned? What did it manufacture?

A. They manufactured sulfonated oils, textile leather, paper, chemicals, and we started to make dyestuffs in 1915.

Q. 11. During the war, Major Sill, what was your service?

A. I was put in charge of the manufacturing operations at Astoria, Long Island, where the absorbents used in the gas mask chemistries were made, namely, charcoal and soda-lime. It was my assignment to erect and operate these plants.

After they had been operating for about a year's time, I received orders to go overseas, where I went into training camp for combat service, and at the time of the completion of my service the Armistice came and there was no use for further active training, and so shortly I was given an appointment to the Inter-Allied Commission to inspect all the German chemical factories which had been occupied in active manufacturing during the war, these factories being in the occupied areas on the Rhine.

Q. 12. And did you, as representative of the United States Army, go into Germany with this Commission and inspect these plants?

A. I did, sir.

Q. 13. How long were you engaged in that?

A. For a period of about two months actively, and another month's time was occupied in writing reports and compiling them, a total of about three months' time.

XQ. 14. Tell us, please, as briefly as is possible under the circumstances, what plants you visited abroad?

A. We went into five of the principal German chemical factories: the Bayer Company at Leverkusen near Cologne; the Weiler ter Meer plant in Uedigen on the Rhine; Meister, Lucius & Bruning at Hoechst-am-Main; the Kalle Company at Biebrich, and the Badische Company at Ludwigshaven and Oppau and several small factories that were in the areas, which, however, do not amount to very much.

Q. 15. You spoke of having made a report. To whom did you make that report?

A. To my commanding officer, the Chief of the Chemical Warfare Service in the A. E. F.

Q. 16. What is the Chemical Warfare Service?

A. The Chemical Warfare Service is a development of this war. It started in a small way when we entered the war in 1917, as a part of the Sanitary Corps of the Medical Department, but as gas and chemical warfare developed so rapidly, it soon outgrew its initial start, so it had to be made into a department of its own, which was known as the Chemical Warfare Department, which exists today on an even larger scale.

Q. 17. Who was at the head of that Chemical Warfare Service?

A. I believe the first head of it was General Birmingham, if I am not mistaken, and then Major General Sybert, and then General Fries, who is now head of it also.

Q. 18. To which one of these officers did you make your report?

A. I made my report to the acting chief of the Chemical Warfare Service, Colonel Johnston, and during the time that we made this report General Fries had come back to the United States, according to my recollection.

Q. 19. Is the Chemical Warfare Service a part of the War Department of the United States?

A. It is my understanding that it is; that it is an active arm of the combat forces of the army.

Q. 20. Have you a copy of your report?

A. I have a crude copy of the report, not a complete copy; only a typewritten, mimeograph copy.

Q. 21. It is a copy of the report that you made?

A. Yes, sir.

MR. KRESEL: Colonel, is there any objection on your part to my introducing that?

MR. ANDERSON: I have not seen it, Mr. Kresel.

I should like to look at it before I say. I do not think the Government would be in any wise bound by the statement. But if it were a matter of shortening the examination, I would like to see it.

MR. KRESEL: The question, Colonel, is not what is contained in the report, nor as to what the efficacy of it may be. That, of course, is argument for the Court. I am only asking whether you will release this officer from any obligation to keep such report secret. That is my real question.

MR. ANDERSON: If your Honor please, my position on that is this: In so far as I as counsel here in this court have authority to do that, I would say that assuming I had examined the report and it looked to me to be a matter not of vital importance to the interests of the Government's military service, I should be very glad to do it. But I question my authority to assent to it, to release any officer of the United States from the obligation of secrecy that exists. I think that would have to come from the War Department, the head of the War Department or the State Department, or the Navy Department, as the case may be.

I can only speak for the United States in the very limited capacity in which I appear in this court, and I would rather err on the safe side than to undertake to exercise an authority which I do not think I have. I took that position yesterday and I take it today. I would be very glad to do anything I could to facilitate getting the information, but I do not think I could exercise that power.

Q. 22. Major Sill, could you give us the date when you made this report?

A. It was made about the middle of March to the first of April, 1919.

Q. 23. Were you the only representative of the United States Army that joined this Commission?

A. No, sir; I was not.

Q. 24. Who else was representing the Army in that committee?

A. Lieutenant-Colonel Norris and six members of the Ordnance Department. I cannot recall all of their names.

Q. 25. This report that you speak of, was that signed by you only or by the other officers?

A. It was signed by all of the officers.

Q. 26. And you say it was made either in March or April, 1919?

A. Yes, sir.

Q. 27. Was that the only report made by you gentlemen on this subject?

A. It was.

MR. KRESEL: Then, Colonel Anderson, without asking this witness to disclose his copy of the report, you now have sufficient identification thereof and I should like you to find out whether we can introduce that report and whether this officer will be relieved of any obligation not to divulge the contents thereof.

MR. ANDERSON: Mr. Galloway, would you take that up with the Department of Justice and ask them to inquire of the Secretary of War if that report can be released?

MR. GALLOWAY: Yes.

MR. ANDERSON: If the War Department consents I shall certainly not object.

Q. 28. I address you as Major Sill without having had you testify as to whether that is your military rank.

A. Yes, sir. I was a major during the time I was

in the service. At the present time I am entirely out of the service.

Q. 29. I understand. Did you enter as a private?

A. No, sir. My first rank was captain.

Q. 30. And you rose to the rank of major?

A. Yes, sir.

Q. 31. We will depart from your military activities, Major, and inquire about some of these patents. Does the firm of E. C. Klipstein & Company hold a license on patents for the manufacture of hydron blues?

A. Yes, sir.

Q. 32. How many patents are covered by that license?

A. Three patents, I believe.

Q. 33. Will you give the numbers?

A. 919,572; 956,348; 966,092.

Q. 34. Have you the copies of those patents before you?

A. I have.

Q. 35. Will you produce them, please.

A. (Handing papers.)

Q. 36. Will you state about what time your corporation took this license and when, if ever, it undertook to manufacture hydron blue?

A. To the best of my recollection, we took out this license about June or July, 1921. We had previously to a considerable extent done some experimental work with the anticipation of being able to produce it, and in such case apply for the license to the proper authority. Our hopes were that we had made better progress, so we applied for the license while still maintaining our research work.

Q. 37. And how long did that research work continue?

A. On one of these products, it continued until about June, 1922.

Q. 38. Now, which one was that?

A. I cannot tell you without looking at the patent?

Q. 39. Just use that?

A. That is our number, 956,348, which is what is known as the Hydron Blue R.

Q. 40. Now, patent 966,092, covers what product?

A. That covers what is known as Hydron Blue G. The research on that was kept up.

Q. 41. Started when, please?

A. That started at the same time. That was kept up until February, 1923.

Q. 42. Now, I want to inquire about the third of these patents, 962,092?

A. You mentioned that. No. 919,572, that calls for a product somewhat analogous to the other two, but not of such commercial value.

Q. 43. What is the name of it?

A. It is a hydron blue which is a fusion product, and it has never the essential valuable properties of the other two. Consequently we have put practically no work on that development, because we knew that it was of secondary value.

Q. 44. So on this last one that you have mentioned, 919,572, you say you put very little work on. Have I the right number?

A. Yes, because of the fact—I meant to say in explanation there——

Q. 45. If you will?

A. 919,572 covers the preparation of an intermediate, indophenol, which was then utilized by fusion process, but the newer developments that covered this latter patent take that same indophenol and treat it in alcoholic sodium sulphide solution, which makes the more valuable acids of the hydron blue. This product here is more or less obsolete, you might say.

Q. 46. I see. So that turning to the other two

patents, as I understand it, you started your research work sometime in 1921?

A. Yes, sir. We had done some as the opportunity arose, as far back as 1918, but not in a serious way as we did starting in the middle of 1921.

Q. 47. Now, take up, please, patent No. 956,348. What did you do in your research work and in your endeavor to produce the product therein described?

A. We followed as closely as possible the specifications given in this patent.

By Mr. Anderson:

Q. 48. What is the number of that patent?

A. 956,348—following the examples and directions given as closely as could be followed on a laboratory scale in an endeavor to work it out as an initial step.

By Mr. Kresel:

Q. 48a. And what result did you obtain?

A. Whereas we obtained some coloring matter with certain other powers, we could not get sufficient yield or sufficient power to produce a product which could be sold economically.

Q. 49. Did you, after completing in so far as you could, your laboratory research of this particular product that you are just talking about, undertake to manufacture on a larger scale?

A. We did, sir. We went to a semi-works scale, and then to a large commercial scale.

Q. 50. Did you eventually produce that product?

A. We did.

Q. 51. When first did you produce the product?

A. On a commercial scale, it was about the middle of May, 1922.

Q. 52. Please now take up patent No. 966,092; is that the product you have described as one covering the production of nitrophenol?

A. No, sir. That covers the production of Hydron Blue G.

Q. 53. Hydron Blue G?

A. Yes, sir.

Q. 54. The substance which I just mentioned is one of the chemicals used in the production, is that it?

A. If you mean nitrophenol, that is one of the intermediates used in the production of this product.

Q. 55. Now, what did you do in your endeavor to produce this product Hydron Blue G?

A. Similarly to what we have done in other cases, and as the usual procedure in the developing of a patent. We endeavored to follow as closely as possible the specifications given in this patent in laboratory experiments. The following examples are cited here and any reference available to guide us in the research work on that.

Q. 56. You have already given the length of time that it took you to make this research?

A. Yes, sir.

Q. 57. Now please state what results you accomplished?

A. We have never been able to satisfactorily produce a product by this patent.

Q. 58. Any product or a product of good quality or good yield?

A. A product of good commercial quality which could economically be sold in the market today.

Q. 59. That is up to today you have been unable to develop it, do I understand that to be your answer?

A. Yes, sir.

Q. 60. Please state what research facilities your company had in this research work that was prosecuted?

A. We have three laboratories: one in New York City in conjunction with the executive offices; one in Edgewater, which is a larger scale operation than the

New York City laboratory; and three laboratories in the plant in West Virginia, where we conduct this research work. We have had various chemists to work on this—American chemists, so far as they were available to obtain; foreign chemists, not only Swiss and English, but German. We have not had the good fortune to successfully work it out.

Q. 61. Do you know, Major, about how much money your company spent in the research work and experimental work under these three patents that you have just described?

A. I do, approximately.

Q. 62. Please state what your personal touch has been with the work and with the expenditure of the money? Do you get my question?

A. Yes, sir. From the start of this company, barring the time that I was in service and away from commercial manufacture, I have been very closely associated not only with the building of the plant, but with the operations. As a member of the board of directors of the company, it has been my province to have access to figures as well as all information regarding the development of various products and operations. Reports have come through my hands giving me this information and I have made frequent visits to the plants and have been in constant touch with the operators and research men; so that I have a very good knowledge of the conditions.

Q. 63. I shall now ask you to state approximately how much money your company spent in this research work.

MR. ANDERSON: I object to that question.

THE COURT: What period does the testimony cover?

Q. 64. Please state, in answer to the Court's question, what period of research work you are about to testify as to the expenditure of?

A. From the period in July, 1921, until February, 1923.

THE COURT: Was the witness in the Army and away from the plant at any time during that period?

THE WITNESS: No, sir.

THE COURT: You may answer.

A. We have expended approximately from $35,000 to $40,000.

Q. 65. Major Sill, from your knowledge of the chemical art, your experience—I think you said nine years' experience—in practical chemical work, in addition to your experience since you have been connected with this corporation, and your knowledge of the research work that you have described in attempting to manufacture according to the specification of these patents, and from the results obtained, could you give an opinion as to the value of these three patents?

MR. ANDERSON: That calls for a yes or no answer.

A. Yes, I could.

Q. 66. Will you state what in your opinion their value was in February, March and April, 1919?

MR. ANDERSON: Same objection as heretofore urged to these questions, without repeating, and the further objection that it does not appear that this witness is a qualified expert.

THE COURT: This is based on the testimony that he has given?

MR. KRESEL: Yes, sir.

Q. 67. You understand that?

A. I understand you want me to give the value of these patents in my opinion.

Q. 68. Yes, sir.

A. I should say that these three patents, their valuation, actual working value is comparatively slight. I would say that patent No. 919,572 would have a valuation of about $250. The other patents

might each have a valuation, on account of the fact that so much work would have to be done in developing them, of $500 apiece.

MR. KRESEL: I offer in evidence patent No. 966,092.

Received in evidence and marked "Defendant's Exhibit No. 278." (*See Patent Exhibit Book.*)

MR. KRESEL: Patent No. 956,348.

Received in evidence and marked "Defendant's Exhibit No. 279." (*See Patent Exhibit Book.*)

MR. KRESEL: Also patent No. 966,092.

Received in evidence and marked "Defendant's Exhibit No. 280." (*See Patent Exhibit Book.*)

Q. 69. There is a question I want to ask you about some of those tanning patents. Major Sill have you had occasion to examine these two late patents of 1922, Defendant's Exhibits 276 and 277?

A. I have, yes, sir.

Q. 70. Have you considered—for your company, I mean—licensing the processes that are contained therein?

A. We have given consideration to that, yes, sir.

Q. 71. Will you state with reference thereto whether there are any intermediates there that were available at the time when these patents were granted?

A. Patent No. 1,421,722, dated July 4, 1922. This calls for the use of intermediates which, so far as I am aware, are not available in this country at the present time and would require considerable research work to develop them satisfactorily. Patent No. 1,414,045 would come under the same classification, the intermediates, are not readily available.

Q. 72. And you did not take any license thereunder?

A. We did not.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 73. What intermediates are there, called for by those patents, that are not in this country at the present time?

A. In those patents, you mean?

XQ. 74. Yes.

A. May I see them and I will give you the names of them.

XQ. 75. (Counsel hands papers to witness.)

A. I would say, so far as I am aware, para-homosaligenine is not available, neither is alphadinaphthylmethane, or dihydroxy-diphenylmethane, or dihydroxy-diphenyl-dimethylmethane, or para-cresoldialcohol, or dihydroxy-dimethyl-diphenyl-dimethylmethane. Those are the principal ones. The others are derivatives from those products in turn.

XQ. 76. Have you ever tried to buy any of them?

A. No, sir; I have not. These patents are recent and they only have been brought to our attention recently.

XQ. 77. Major, who told you they were not available in this country?

A. That is my judgment.

XQ. 78. And you formed that judgment without ever trying to buy them at all in this market?

A. I formed my judgment from my contact with the market and knowledge of manufacturing conditions as they exist today.

XQ. 79. Are those intermediates which you mention chemical products or reactions in the various processes named in these patents?

A. Most of those I named were the basic raw materials to start with.

XQ. 80. The basic raw materials?

A. Yes, sir.

XQ. 81. Are they recognized materials in the chemical markets of the world, do you know?

A. No, sir; they are rather rare. They are not readily commercially available articles.

XQ. 82. Not readily available in the markets of this country, but do you know the condition of the markets abroad on that subject?

A. To a certain extent I do.

XQ. 83. Are they available over there?

A. Not so far as I am aware.

XQ. 84. But they are recognized in the chemical world as chemical products or intermediates, are they?

A. Yes, they are existent, but they are not made commercially.

XQ. 85. You never tried to produce them under these patents, then?

A. We have not tried to.

XQ. 86. Do you know whether they are patented intermediates or covered by any patents?

A. I do not.

XQ. 87. Have you ever tried to make any one of the intermediates which you mentioned?

A. No, we have not. We don't consider it worth while to try.

XQ. 88. Gave it up without a try, did you?

A. I have never seen those patents until recently, on account of their being of recent issue.

XQ. 89. You never have seen the specifications for making those particular intermediates?

A. No, sir.

XQ. 90. Are you a chemist, Major, and, if so, where did you graduate in chemistry?

A. Yes, sir. From Princeton University.

XQ. 91. Have you any chemical degree?

A. I have a Bachelor of Science degree. There is no chemist's degree from Princeton University.

XQ. 92. Have you conducted personally the ex-

periments under the various dye patents as to which you have testified?

A. I have not.

XQ. 93. The research was done by a chemist in the several laboratories which you have named, is that true?

A. Under the authority of the board of directors, of which I happened to be one.

XQ. 94. You have not personally conducted any of the experiments or chemical processes provided for in the three or four dye patents to which you have referred?

A. Not in any special dye patents; no, sir.

MR. KRESEL: Three?

MR. ANDERSON: Three patents, yes.

XQ. 95. Hydron Blue G is quite an important dye, is it not?

A. It is a dye which shortly before the war started was beginning to secure prominence. It had never been developed on a very large scale. During the war imports were cut off, but it has properties of considerable interest and value.

XQ. 96. It has?

A. Consequently we were interested in taking it up.

XQ. 97. Hydron Blue R is also a dye of considerable importance in the commercial world, is it not?

A. Of considerable interest.

XQ. 98. What?

A. Of considerable interest; yes, sir.

XQ. 99. Before you began this series of efforts to manufacture these products, did you make laboratory experiments or cause them to be made, under the patents?

A. We did, sir.

XQ. 100. With what results? Did you get the

Hydron Blue R and the Hydron Blue G under the respective patents in your laboratory?

A. Not satisfactorily at first, only upon exhaustive——

XQ. 101. Not with satisfactory results?

MR. KRESEL: Wait a minute. He had not finished.

MR. ANDERSON: I thought he had finished.

A. I say only after exhaustive research work on the Hydron Blue R. We have never been able to get the Hydron Blue G.

XQ. 102. You mean for manufacture or in the laboratory?

A. I refer to both.

XQ. 103. Did you go to work and spend twenty or twenty-five thousand dollars for your company in manufacturing efforts before you had made laboratory tests of these processes?

A. We spent that money in toto on this work, Colonel Anderson. Some of it was successful.

XQ. 104. Some of it?

A. Some of it. On the Hydron Blue R, we produced that product.

XQ. 105. You did?

A. We did.

XQ. 106. Did you first produce it in the laboratory?

A. We did.

XQ. 107. And you produced it under the process named in the patent?

A. No, sir.

XQ. 108. What variation from the patent did you take?

THE COURT: Do you understand the ruling of the Court with respect to that?

THE WITNESS: Yes, sir.

THE COURT: You are at perfect liberty to dis-

close it if you wish, but you need not if it involves trade secrets. In that case you may withhold the information.

A. On the ground that it does represent a considerable amount of exhaustive and expensive work to develop it and produce it ourselves, on information which the patent did not give, I do not feel I should disclose it.

XQ. 109. Are you speaking of your laboratory work or your manufacturing work?

A. I am speaking of both.

XQ. 110. Major, you did not do the laboratory work at all, did you?

A. Personally, I did not; no, sir.

XQ. 111. Can you speak of your own knowledge of the results obtained in the laboratory effort or experiments?

A. Yes, sir.

XQ. 112. Did you produce in the laboratory Hydron Blue G?

A. We did not.

XQ. 113. R, I mean.

A. R, we did.

XQ. 114. Now I will ask you again to state in what respect the method employed by you in producing the Hydron Blue R varied from the process defined in the patent, and to that end I will ask you to take the patent and say what you did under the patent, and then say what you did in producing the satisfactory product.

A. The modification which we had to employ and the additions which we had to use I regard as trade secrets which I am not prepared to disclose.

MR. ANDERSON: Your Honor will note, of course, an exception to his refusal to answer the question.

XQ. 115. I will ask you now to state just what

you got as a result of your experiment under the patent, taking the patent, and stating the exact process followed and what was the result?

MR. KRESEL: Which patent?

MR. ANDERSON: The patent on the Hydron Blue R which is No. 956,348.

XQ. 115. (Continued.) Now I will get you to take that patent, and state exactly what your laboratories did, of your own knowledge, under that patent (Handing patent).

A. Of my knowledge our laboratories took this patent endeavoring to work out the process as described here, namely, the proportions of 160 kilos of sodium sulphide crystals, and——

XQ. 116. I will not require you to read the patent.

A. That is specified under the example here.

XQ. 117. Which example?

A. There is only one example shown here.

XQ. 118. Were you present when that experiment took place?

A. I was present during part of the time, not during the whole time.

XQ. 119. In what year did you make the experiments?

A. We did some experimenting as far back as 1918. The intensive experiments were developed in the latter part of 1921 and the first part of 1922.

XQ. 120. And you were present only a part of the time when the experiment took place?

A. Yes, sir.

XQ. 121. Are you prepared to say of your knowledge that the chemist making the experiment followed each step through in accordance with the process as defined in that patent? I am speaking of your knowledge?

A. I believe that he did.

XQ. 122. I did not ask you, Major, what you believed. I asked you what you knew.

A. May I inquire, do you mean by that, do I know from a report or from my actual participation?

XQ. 123. No, I mean from your knowledge. The report is what somebody else says.

A. I did not observe him do it. I only know from report. I have no reason to believe that the report is dishonest.

XQ. 124. I do not either; but the question that I am raising is technical purely.

A. I did not see him do it.

XQ. 125. So you do not know of your own knowledge whether the chemist, outside of the information of which you have spoken, the chemist employed by the Bayer Company, actually followed that process or not, do you?

A. I only know as an ordinary member of the board of directors that the reports made to them by subordinate members of the firm are to be taken as accurate and honest. That is the only way I know.

XQ. 126. That is all the knowledge you have on the subject?

A. Yes, sir.

XQ. 127. So far as you recall, that experiment or research took place in the summer of 1921?

A. And the spring of 1922.

XQ. 128. When did you take out a license under this patent; do you recall?

A. I cannot recall the exact date.

XQ. 129. It was after that experimental work, was it not?

A. No, sir, it was before the intensive experimental work. It was after some of the preliminary work was done on that semi-serious scale.

XQ. 130. Taking patent No. 966,092, that covered Hydron Blue G, did it not?

A. I cannot tell you without seeing that sir, what the numbers are.

XQ. 131. All right. I will bring them around to you. I thought you remembered the numbers (hands patents).

A. No. 966,092 covers the Hydron Blue G, and No. 956,348 covers the Hydron Blue R.

XQ. 132. Both of them are product patents, are they not?

A. I think they are both product and process.

XQ. 133. Before I leave the Hydron Blue R, you have in fact manufactured and sold in the market a good deal of this Hydron Blue R dye, have you not?

A. Not a very large quantity, no, sir.

XQ. 134. But you have manufactured and sold a commercial product?

A. Yes, sir.

XQ. 135. And you paid royalties under the licenses on that product, did you?

A. We have; yes, sir.

XQ. 136. And those licenses were issued under the patent which you have named as applying to that product, is that true?

A. Yes, sir.

XQ. 137. Are you now engaged in the manufacture of that product?

A. We are not.

XQ. 138. How long since you stopped?

A. We stopped about October or November, 1922.

XQ. 139. In the case of the Hydron Blue G you stated, I believe, that you had never been able to produce a satisfactory product of a quality which could be economically produced commercially?

A. Yes, sir.

XQ. 140. That is about the substance of what you said?

A. Yes, sir.

XQ. 141. Did you produce any of the product at all?

A. Not satisfactory.

XQ. 142. Is your knowledge of the experimental work under the patent covering Hydron Blue G the same as under the other patent, without going through the details of it?

A. Yes, sir.

XQ. 143. Derived from the same sources?

A. Yes, sir.

XQ. 144. And limited to the same sources?

A. Yes, sir.

XQ. 145. You cannot testify of your own knowledge as to exactly what was done by the chemists under either patent?

A. If you mean by that only my personal observation and my own action in conducting tests, I cannot. But I can testify from reports given me, which I have no reason to doubt.

XQ. 146. Now I will ask you as to this second patent, Hydron Blue G, whether you varied the process named in the patent, or whether your company did in any respect; and if so, in what respect? I should say, perhaps, that you may not be misled, that the question substantially calls for an answer as to the process used by or experimented with by you, as to which his Honor suggested a moment ago to you, if it involved trade secrets, you need not answer. I do not want to elicit an answer from you contrary to the Court's ruling. It is for you to determine whether you wish to answer.

A. I do object to answering for the same reason.

MR. ANDERSON: I beg to note an exception.

XQ. 147. Major, in arriving at the value of these patents which you undertook to place on them, in your opinion, did you consider the fact that they were product patents and that any manufacturer of Hydron

Blue G in this country would be required to pay licenses thereon to The Chemical Foundation, if it were the owner thereof, or to the owner thereof?

A. I did, sir.

XQ. 148. Do you know the amount of Hydron Blue G that is sold in the United States in a year?

A. I am aware of the amount which was imported prior to the war and also of the market conditions at the present time.

XQ. 149. How much was imported prior to the war?

A. About $33,000 worth.

By Mr. Kresel:

Q. 150. You mean the whole time prior to the war?

A. The Tariff Report for the year 1914, it is my recollection, gives it as $33,000. I speak from memory.

By Mr. Anderson:

XQ. 151. That is taken from the Tariff Report?

A. Yes.

XQ. 152. If that is different, would you vary your answer accordingly?

A. Yes.

Mr. Kresel: What is that?

XQ. 153. If that report shows a different amount, you would vary the figure, if that is the source of your information, would you not?

A. Certainly.

XQ. 154. And in regard to Hydron Blue R, do you know the extent of the market for that dye?

Mr. Kresel: That is what he was talking of.

Mr. Anderson: No, he was speaking of G.

A. I was answering for both of them.

By Mr. Kresel:

Q. 155. Which was the first one—$33,000?

A. Pardon me. That represents the total of Hydron Blues imported.

By Mr. Anderson:

XQ. 156. Both G and R?

A. Yes, sir.

XQ. 157. How much was sold of those dyes in 1919 in the United States?

A. I do not know; no, sir. I have an idea——

XQ. 158. That would also be in the Tariff Commission report, I assume, if you had that information coming from there?

A. Yes, sir.

XQ. 159. Major Sill, when you were speaking of the value were you speaking of the value at the present time of these patents?

A. I was speaking of the value at the time we took the license.

XQ. 160. At the time you took the license in 1921?

A. Yes, sir.

XQ. 161. At that time you had made no experiments at all, had you?

A. We had not on that particular product; those products, you might say.

XQ. 162. Did you take into consideration the experience you had had since then when you undertook to fix the price, prior to that experience?

A. I took into consideration both our prior and our later experience.

XQ. 163. You did?

A. Yes, sir.

XQ. 164. So that in arriving at a value in 1921, you took into consideration your experience in 1922 and 1923?

A. Yes, sir.

XQ. 165. In 1921, you took out licenses under those patents, did you not?

A. Sometime during 1921, yes, sir.

XQ. 166. And you entered upon a scale of ex-

penditure in development which finally resulted in your spending how much money?

A. Thirty-five to forty thousand dollars.

XQ. 167. You spent thirty-five to forty thousand dollars to develop patents which in 1921 you would not have regarded worth over five hundred dollars?

A. So far as the patents themselves go, yes, sir.

XQ. 168. Those patents at that time?

A. Yes, sir.

XQ. 169. And you would not have thought that a patent which gave you the right to charge a royalty on all the products in the United States, and which has justified you in expending thirty-five to forty thousand dollars to develop the product, was worth over five hundred dollars, this right being given to you during the life of the patent?

A. Taking into consideration my knowledge of the existence of the fact that the patent is only a first step and required a considerable expense to develop it, I do not think the valuation was low.

XQ. 170. You do not think the valuation was low?

A. No, sir.

XQ. 171. And you do not think that the right of that holder of that patent to collect royalties at reasonable rates to be fixed by him upon the entire amounts of Hydron Blue G and Hydron Blue R imported in this country or produced in this country and sold in this country during the entire remaining life of these two patents was worth more than $500; is that your idea?

A. Taking into consideration the extraordinarily heavy expense necessary to develop them and the fact that after they are developed, owing to the initial cost of the basic raw materials from which they are made, the resulting product has such a high net cost that it cannot be sold in competition with the existing cheaper products as Indigo and some of the Sulphur Blues, I

answer affirmatively that I think that value is sufficient.

XQ. 172. And the reason you quit manufacturing was that you could not compete with the cheaper products; is that the idea?

A. On the Hydron Blue R, but not on the Hydron Blue G, because we could not produce it by all the information that was available.

XQ. 173. Do you know whether any chemists that you had working on this matter had ever before had any experience in producing either Hydron Blue G or Hydron Blue R?

A. Yes, sir.

XQ. 174. Who?

A. One man came to us because of the fact that according to this report he had produced this product in Europe.

XQ. 175. When did he come to you?

A. The early part of December, 1921.

XQ. 176. Which of these products had he produced?

A. He had worked on both of them.

XQ. 177. Had he actually produced them?

A. I believe that he had produced them on a small scale, and that according to the information which was given us he had the "know how".

XQ. 178. He told you he had the "know how", did he?

A. Yes, sir.

XQ. 179. Did you find that he had the "know how?"

A. I found that by co-operation with our own men, we were able to produce Hydron Blue R, but never to produce Hydron Blue G.

XQ. 180. Had he ever produced Hydron Blue G for the commercial market before he came here?

A. No.

XQ. 181. And he was the only man that ever had any experience introducing either of them before your experimental work, was he not?

A. The men who had been working on it did not produce it, but those men were trained chemists along other lines, and it was naturally supposed they would be able to attack the situation, the type of research chemists that you would naturally put on.

MR. ANDERSON: Read the question. The answer is not responsive. (Question repeated as recorded.)

XQ. 182. That is the Hydron Blue G and R, as you so understood it?

THE COURT: Is it your contention on either side, either side may answer this—that the only persons to whom the patent speaks are those who have had experience in manufacturing in a laboratory or on a commercial scale, those things covered by the patent. If so, I fail to see how there can ever be an invention, because an invention is supposed to be something new, and if to make something which is invented and patented it requires the employment of persons already skilled in its manufacture, it seems to me that produces a situation which I do not understand. Can you help me out on that, Colonel Anderson?

MR. ANDERSON: I think so, sir. I think that experience, as Dr. Bolton has so well said this morning, is one of the factors in the "know how"; whether it is the controlling factor in the "know how" is another thing. We cannot take out any particular element in human experience, in the operation of a human mind and say that that is the controlling element; we must take them all together. A man skilled in the art must have certain qualities, and one is more skilled in the art than another. A man may be a most able lawyer

on ejectment who would not know how to conduct a criminal case in court, and it would be thrown out on the first procedure.

THE COURT: May I make this inquiry, because we are talking on cross purposes, and I do not understand you, and you do not understand me.

By THE COURT:

Q. 183. What was the color that you were unable to produce?

A. Hydron Blue G.

Q. 184. Hydron——

A. Hydron Blue G.

Q. 185. Hydron Blue G?

A. Yes.

THE COURT: Now, at the time that patent was taken out in this country, at least the time the application was filed, I assume there had been no Hydron Blue G manufactured in this country. Now, then, where is a person who begins to manufacture under that patent to get his experience in manufacturing Hydron Blue G?

MR. ANDERSON: He would have to get his experience by the experimental work as we derive all our experience, and it would mean a good many errors to get it through. There is not any question about that. It seems to me it is self-evident. But as we have gone into it so elaborately as to how long it would take to produce commercially those dyes, working with men without any experience in their production, which is somewhat different from other countries, I think it is one of the facts to be considered whether they had any experience in their production, and whether they had to learn themselves, as well as to learn the patents and when I say learn themselves, I mean find out, and whether they had to be taught

it, as well as learn the patent in the process of that development. Those are factors to be considered the weight of which must be considered by the Court in the consideration of the facts.

THE COURT: Yes; but you have presented a sort of paradox to me which I do not yet see the solution of; but who were the men skilled in the art in America to whom this Hydron Blue G patent spoke under your contention?

MR. ANDERSON: I should say that there were very few men in America skilled in the art, and that was one of the reasons. There were some men perhaps in America who had had experience to whom a patent for Hydron Blue G would speak. There were very few men, I think, skilled in the art in this country at that time, in the true sense, skilled in the art. That is one of the disadvantages under which the country was laboring. There has not been any dispute about that.

THE COURT: I am not disputing that, but I was seeing just what your position is in respect to it. I am not sure whether I understand your position with respect to its effect upon value.

MR. ANDERSON: Probably, sir, and I am quite ready to state when this question is read over to me, it is rather narrower than I intended to make it and I should ask other questions. The question that I would have asked perhaps, following that, was whether these chemists which he said he had working on those experiments were men who actually produced other dyes, and if so, what dyes? All of that would have bearing upon the extent of the men's experience. I at least wanted to know. He said he had one man that had abroad actually produced Hydron Blue R, but did not claim to produce Hydron Blue G, as I understood it. I was getting at what was the scope of the

knowledge of these men who were supposed to be making these experiments, that is all.

THE COURT: I think this answer is responsive and the motion to strike out is not granted.

MR. ANDERSON: I will work it out this way, Major——

MR. KRESEL: You withdraw the question?

MR. ANDERSON: Yes, I will withdraw that question to shorten the discussion.

XQ. 186. Did you have in your employ in December, 1921, at or when these experimental processes were going on, any other persons than the men whom you have named who had any experience as chemists in the industrial or commercial production of either of these dyes which you have mentioned, that is R and G?

A. Will you read the question?

(XQ. 186 repeated as recorded.)

A. We did, yes, sir.

XQ. 187. Who was it?

A. There was one other laboratory chemist, and we had three men, not primarily in R and G, but who had been producing allied products for a considerable time.

XQ. 188. You had one laboratory chemist who had produced what in the laboratory?

A. Hydron Blue R.

XQ. 189. Had produced any in your laboratory?

A. In Europe.

XQ. 190. Did he tell you that he did?

A. Yes, sir.

XQ. 191. Do you know whether he produced it under this patent?

A. He did not.

XQ. 192. Did he produce it under the German patent, the same material?

A. He produced it by a modification of this pa-

tent here, in conjunction with our own research work. It was a question of co-operation.

XQ. 193. You mean here?

A. Yes.

XQ. 194. And that is the modification which you say you cannot disclose?

A. Yes, sir.

XQ. 195. Now, I will ask you—you said you had three other men who had been engaged in producing allied dye materials—where?

A. In our plants.

XQ. 196. How long?

A. One of them over a period of six years, one of them who had been not in the manufacture but in the dye business for a period of twenty-five years.

XQ. 197. Had been in the dye business, but not manufacturing?

A. Yes, sir, and the other man had been about two years.

XQ. 198. And what dyes were you making during the period they were working for you, sulphur colors?

A. Sulphur colors and some azo colors.

XQ. 199. Some azo, but chiefly sulphur colors, were you not?

A. Yes, sir.

XQ. 200. Now, with those exceptions you did not have anybody in your employ at that time that knew anything about the production of R or G or processes of that character, I mean, as chemists I am speaking, of technical knowledge and commercial knowledge?

A. With those exceptions—I did not get the last part of your question.

XQ. 201. I suppose my question was involved. (Question repeated.)

A. Allied processes similar to these.

XQ. 202. What I meant was this: Have you now named to me the men of a technical or commercial

education and experience whom you had in your employ engaged in this experimental work on these dyes?

A. Yes, sir.

THE COURT: You say you are getting tired, Colonel Anderson?

MR. ANDERSON: I am very tired.

THE COURT: Are you about through?

MR. ANDERSON: I am about through. I do not think I will have more than one question and we can finish with that question. I am very tired, indeed.

XQ. 203. Mr. E. C. Klipstein is president of the E. C. Klipstein & Sons Company and Treasurer of the A. Klipstein & Company, is he not?

A. He was, up until the time of his death, on April 29th.

XQ. 204. He was. He is dead now. He was until April 29. Those are the companies as to which you have spoken here this afternoon, are they not?

A. Yes, sir.

MR. ANDERSON: I would now ask leave, if your Honor please, and if leave is granted, I will not do it until tomorrow morning, in order to get rid of this witness, to read into the evidence two or three statements from the testimony of Mr. Klipstein given before the Committee on Finance of the United States, Senate Hearings on H. R. 8078, from which there have been various readings, at which time he appeared as a representative of the two companies for whom this gentleman and the witness preceding appeared in this Court. You won't object to it, will you?

MR. KRESEL: Of course I shall object. You cannot read the statement of a dead man against us here.

MR. ANDERSON: Well, that depends. Very

often the statement of a dead man can be read in evidence.

THE COURT: If you can show me here the the ground on which a statement of this particular kind can be made—you will find the proceedings in the Court of Appeals in this Circuit, in Smythe v. New Providence Township, by which I am controlled, and if you can bring it within that case, why, it will be admitted, otherwise not.

MR. ANDERSON: Reserving that question which I wanted to raise while the witness was on the stand, I will say I have no further questions.

THE COURT: Have you any re-direct?

MR. KRESEL: No.

THE COURT: Do you want to swear another witness now or in the morning?

MR. KRESEL: Anything that is agreeable to your Honor; how long do you sit?

THE COURT: Four-thirty in any any event.

MR. KRESEL: I think perhaps as long as it is within ten minutes of the adjournment hour we might as well adjourn now.

THE COURT: Adjourn court to 8:30 o'clock to-morrow morning.

(Whereupon, at 4:20 o'clock p. m., the further hearing was adjourned until 8:30 o'clock a. m., standard time, Thursday, 19th July, 1923.)

THIRTY-FIRST DAY.

Wilmington, Delaware, July 19, 1923, at 8.30 o'clock A. M. (Standard Time).

Before:

HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. ANDERSON: If your Honor please, I noted last night an error in one of my statements, where I am reported as using the word "material" when I did use the word "immaterial," in addressing the Court. They are, of course, directly in conflict, and I have spoken to Mr. Kresel and corrected the record at page 3680, and put in the word "not" so as to make the sentence read correctly.

MR. GALLOWAY: If your Honor please, in the preparation of the record for print we have discovered some duplications and other errors which we wish to correct, and we understand that they should be corrected of record so that the clerk would be authorized to follow the plan which we outline in that way.

I therefore would ask that the memorandum entitled "opinion accompanying Mr. Hoguet's letter in response to the inquiries contained in your communication of January 24, 1918," be detached from Plaintiff's Exhibit No. 6 and attached to Plaintiff's Exhibit No. 7.

THE COURT: Have you agreed upon these changes in the record?

MR. GALLOWAY: Our associates have been in conference with counsel for the defendant, and they have agreed, as I understand.

THE COURT: Have you a memorandum of the changes which you desire?

MR. GALLOWAY: I have not a memorandum except in pencil form, as we were informed that the clerk desired the order to be made in open court.

THE COURT: Then why not just give your pencil memorandum to the stenographer and let him embody that in the record, and then at the end of that he may insert "so ordered."

(The memorandum referred to by Mr. Galloway reads as follows:)

"Detach memorandum entitled 'Opinion accompanying Mr. Hoguet's letter in response to the inquiries contained in your communication of January 24, 1918,' from Plaintiff's Exhibit No. 6 and attach it to Plaintiff's Exhibit No. 7. (*See Exhibits, Vol. I, page 45.*)

"Connected with the minutes of September 5, 1919, of the Executive Committee of the American Dyes Institute, which is Plaintiff's Exhibit No. 552, are the minutes of the meeting of the Executive Committee of the American Dyes Institute of September 11, 1919. It is requested that such minutes of September 11, 1919, be designated as 'Plaintiff's Exhibit No. 552-A.' (*See Exhibits, Vol. II, page 1268.*)

"Connected with the minutes of the meeting of the American Dyes Institute of July 10, 1919, which is Plaintiff's Exhibit No. 547, are minutes of the meeting of the sub-committee of the Executive Committee of the American Dyes Institute of July 10, 1919. It is requested that the minutes of the meeting of the sub-committee should be designated as 'Plaintiff's Exhibit No. 547-A.'" (*See Exhibits, Vol. II, page 1249.*)

THE COURT: So ordered.

MR. GALLOWAY: I thought also that perhaps it might be well to have a general order that where a

duplication of exhibits occurs, upon agreement by counsel of both the plaintiff and the defendant one of those exhibits be not printed.

THE COURT: Certified in writing to the clerk.

MR. GALLOWAY: We shall be glad to do that.

I also wish to offer at this time a stipulation by counsel for plaintiff as well as counsel for defendant, concerning the diminution of the report of A. Mitchell Palmer, as Alien Property Custodian; and request that the same be printed in the record. It is signed by counsel for both parties, and is to be filed.

THE COURT: Let it be filed and the record printed in accordance therewith.

(The stipulation referred to reads as follows):

"STIPULATION.

"WHEREAS, the plaintiff has heretofore offered and there have been filed in evidence portions of the official report of A. Mitchell Palmer, as Alien Property Custodian, as of February 15, 1919, as follows: (1) the portions which appear as Exhibit No. 2 to defendant's answer herein, received in evidence as Plaintiff's Exhibit No. 12: (2) the letter transmitting the report to the President (found on the page immediately following the title page of said report) received in evidence as Plaintiff's Exhibit No. 13; and

"WHEREAS, thereafter the plaintiff offered in evidence (3) Chapter I of said report which was not as such filed as an exhibit herein, and the defendant offered in evidence the whole of said report reserving, by leave of court, the benefit of the previous offers by plaintiff of the portions of said report hereinabove specified;

"*Now, Therefore,* for the purpose of simplifying and shortening the record it is hereby stipulated by and between the parties hereto through their respective counsel as follows:

"1. The three portions of said report heretofore offered by the plaintiff as hereinabove speci-

fied shall be printed in the order in which they appear in the printed book under Plaintiff's Exhibit No. 13, suitable cross reference being made thereto under Plaintiff's Exhibit No. 12.

"2. The following portions of said report shall be printed as Defendant's Exhibit No. 30 with a note that by stipulation of counsel the report is not printed in full, and with suitable cross reference to the portion thereof printed as Plaintiff's Exhibit 13.

"(a) All of Chapter IV.

"(b) That portion of Chapter VII, beginning near the top of page 126 with the caption 'Hamburg-American and North German Lloyd Dock' and extending to the end of said Chapter on page 127.

"(c) Portions of Chapter XII, as follows:

"Beginning with opening of Chapter, page 163, and including down to the bottom of page 167; omit to the caption 'Division of Patents,' page 181; include beginning with said caption and extending to the bottom of page 184; omit balance of Chapter.

"(d) That portion of Chapter XIII, beginning with the caption 'Selling Division' near the bottom of page 217, and including down to the caption 'Mail and Files Department,' near top of page 223.

"(e) That portion of Chapter XIV, beginning near top of page 239 with the words 'Other duties,' and including down to the bottom of page 242.

"3. None of the remainder of said report shall be printed in the record.

"Dated at Wilmington, Delaware,
this 14th day of July, 1923.

UNITED STATES OF AMERICA,
Plaintiff.
By (Sgd.) HERMAN J. GALLOWAY,
Solicitor.

THE CHEMICAL FOUNDATION,
INCORPORATED,
By (Sgd.) LUCIEN H. BOGGS,
Solicitor."

MR. GALLOWAY: There is one thing further. To the Federal Trade Commission licenses which were filed as plaintiff's exhibits in this case there were attached copies of United States patents which those licenses concerned. In some instances there was a notation to such license that the patent was not filed therewith because it was out of print at the time the license was executed. We have compiled those missing patents and ask that they be annexed to the respective Federal Trade Commission licenses in evidence to which they relate, so that they may be in the record.

I might say that we have agreed with the defendant upon a patent book which will avoid the printing of many of these patents, but both sides, I think, wish to have them all in the record.

THE COURT: What number do you want these to take? Do you want these made part of the exhibits of the Trade Commission licenses?

MR. GALLOWAY: I think that will not be necessary for the reason that the license refers to it, and we are not going to print any of the patents. We are going to put them in a patent book.

MR. ANDERSON: There is one other matter that I would like to call attention to at this time. I do not know just the status of the record with regard to the testimony of Dr. Holdermann and without, at this time, opening up the question of its admissibility, it was taken before the Court in advance of the trial, the Court stating that it was sitting as a Master. I understood it was taken as a part of the evidence of the case and did not need to be introduced, as would be the case with a deposition. There is some question as to that.

THE COURT: I do not recall a reference made to its being taken as Master, but my understand-

ing of it, and I so hold now, in order to make the record proper, is that it was taken as if he had been put on as your first witness after your opening.

MR. ANDERSON: That was my understanding. I only wanted to make the record quite clear, so that there would be no question.

THE COURT: Are your amendments to your bill complete?

MR. ANDERSON: Mr. Galloway tells me that all the orders have been entered.

THE COURT: You referred to Dr. Holdermann. There was some statement made by him which needed some alterations before it was filed. Has that been done?

MR. GALLOWAY: We have a statement here which he prepared and sent down here, and with the exception of two portions, I have agreed with Mr. Hershkopf——

THE COURT: It is not quite ready then. As soon as it is ready, let it be filed.

MR. KRESEL: I will now call Dr. Crossley.

MOSES L. CROSSLEY.

MOSES L. CROSSLEY was called as a witness on behalf of the defendant, and being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Have you given your full name?

A. I have.

Q. 2. And your residence?

A. Bound Brook, New Jersey.

Q. 3. And your profession?

A. Chemist.

Q. 4. Will you state your education and your professional experience?

A. I was graduated from Brown University in the Class of 1909 with the degree of Bachelor of Philosophy. Received the Master of Science degree from the same University in 1910 and the Doctor of Philosophy degree from the same University in 1911. I was instructor in chemistry at Brown University from 1909 to 1911, during the time of my graduate study. I then was Associate Professor of Chemistry and Biology at William Jewell College, Liberty, Missouri, 1911 to 1913; Associate Professor of Organic Chemistry, Wesleyan University, Middletown, Connecticut, 1914, acting head of the Department of Chemistry, Wesleyan University——

Q. 5. Wait a minute, please. You may proceed.

A. Acting head of the Department of Chemistry in the same university, 1914 to 1918. During that time I was concurrently consulting chemist for the Barrett Company during the years 1916 to 1918. Since 1918 I have been Chief Chemist for the Calco Chemical Company, at Bound Brook, New Jersey. I have conducted considerable research on problems in organic and biological chemistry, the results of which have been published in several technical papers, and am also the author of several non-technical papers on educational problems.

Q. 6. What is the business of the Calco Chemical Company.

A. The manufacture of intermediates, dyes and pharmaceuticals.

Q. 7. Dr. Crossley, have you ever had occasion to undertake to produce cinchophen under the German patent covering that drug?

A. I have.

Q. 8. What is the number of that patent?

A. 1,075,171.

Q. 8-a. I show you Defendant's Exhibit No. 152. Is that the patent?

A. It is.

Q. 9. Please state when first you undertook the experiment for the production of cinchophen?

A. I personally started to work on this patent in 1918; but the company had worked on it from the early part of 1917.

Q. 10. Now, what did you do in undertaking to produce cinchophen?

A. We tried to follow exactly the description of the process as outlined in this patent.

Q. 11. You say you tried to do it; did you do it?

A. We actually did. Not only did I personally observe the individual steps of one man, but several men, over a period of at least one year, before we gave up the attempt.

Q. 12. What was the result of your efforts and those of your associates in following out the steps described in the patent?

A. The result was an impure mixture of cinchophen and tar, chiefly tar.

Q. 13. Was the product such as could be used as a drug?

A. The product was not safe to be used as a drug and was not salable.

Q. 14. Did you undertake to produce neocinchophen?

A. We did.

Q. 15. What is the number of the German patent covering that drug?

A. 1,045,759.

Q. 16. I show you Defendant's Exhibit 153. Is that the patent (handing witness paper)?

A. It is.

Q. 17. Will you please state what you did in attempting to produce neocinchophen?

A. We followed the description of this patent in detail.

Q. 18. Will you state about when you started these experiments, how long they took, how many men were engaged therein?

A. The work on neocinchophen started in the latter part of 1918, and continued intensively as a research problem until the latter part of 1919. There were continuously at work from two to six men on the problem.

MR. ANDERSON: Your Honor, I suppose it is understood that this evidence is subject to the same objections on my part as made to the other evidence of similar character, which I request be considered.

THE COURT: Yes, but won't you state them so there may be no doubt as to what those objections are now, Colonel Anderson?

MR. ANDERSON: The general objections of immateriality, irrelevancy and incompetency, of course, apply to all this evidence.

THE COURT: Yes.

MR. ANDERSON: In the second place, the evidence as to these patents which is here sought to be introduced is objected to upon the grounds which I stated in the combined motion to strike out and objection. I do not know that I can recall them all at this time, and I might get the record very quickly, but the grounds chiefly go to questions of estoppel.

THE COURT: Dealing with the validity or invalidity of the patents?

MR. ANDERSON: Dealing with the validity or invalidity, but I think they are estopped just as

much to introduce this evidence as other evidence. Your Honor recalls the grounds.

THE COURT: Yes. They are overruled, and we will take the evidence.

Q. 19. What was the result of the experiments that you have described following out the steps set forth in that patent?

A. The result was an impure neocinchophen, which was not suitable for human consumption.

Q. 20. Did you also undertake to produce procaine?

A. We did.

Q. 21. Otherwise called novocain. Please give me the number of that patent?

A. 812,554.

Q. 22. I now show you Defendant's Exhibit 155. Is that the procaine patent?

A. It is.

Q. 23. Please state what you did in endeavoring to produce procaine?

A. We followed the description in this patent in detail.

Q. 24. How long did you experiment?

A. The work on procaine extended over a period of four years.

Q. 25. How many men were employed therein?

A. There were from two to eight men, the greater part of the time an average of four men.

Q. 26. What were the qualifications of these men that were engaged in this experimental work on the procaine, cinchophen and neocinchophen that we have thus far discussed?

MR. ANDERSON: I move to strike out the answer to the next question above and the one preceding that, on the ground it is not responsive to the question. He asked him what he did, and he said the work continued for four years. That is

not responsive, and the sole matter that he can testify to is what he himself did.

MR. KRESEL: On the contrary, my question included just that. I asked him to state how long it took and how many were engaged.

MR. ANDERSON: But the preceding question.

MR. KRESEL: Let us have it read.

(Q. 24 and Q. 25, with the answers thereto, read as recorded above.)

MR. ANDERSON: The work may have been going on for four years and he may not have touched it. You asked him how long he had experimented.

MR. KRESEL: I see nothing wrong with that answer.

THE COURT: You may ask him now if you desire, Colonel Anderson, whether that was under his direct knowledge, so you can bring your question and that question together.

By MR. ANDERSON:

Q. 27. Did you actually do this work yourself?

A. I did not actually do it with my hands. I planned the work, and I observed the work done by the men.

Q. 28. What year?

A. The work started in 1918 and continued through to 1922.

THE COURT: You may proceed, Mr. Kresel.

MR. KRESEL: Will you repeat the last question? I do not believe it has been answered.

(Q. 26 repeated as recorded above.)

A. All of them were men with at least a Doctor of Philosophy degree. Two of them were men recognized as authorities in organic chemistry in this country. Both of them a part of the time did the work in connection with a university.

Q. 29. Were they all professional men?

A. All professional men; yes.

Q. 30. What result did you obtain after this experimental work on procaine? I mean, what result did you obtain by following the specifications in the patent?

A. After two years of continuous work on different steps in the patent, we obtained only a mixture of impurities containing some procaine, which we could not utilize.

Q. 31. Dr. Crossley, can you state approximately the cost of the research work that you have described on procaine?

MR. ANDERSON: I object on the ground that he has not been shown to be qualified to testify on that subject.

THE COURT: You may ask him the preliminary question first.

MR. KRESEL: That is all I have asked him, whether he can state. I did not ask him the amount.

MR. ANDERSON: I thought the question went to the amount. I withdraw the objection to that question.

A. I can.

Q. 32. What knowledge have you as to the amount spent? I mean, what did you have to do with the spending of the money? How did it come under your supervision, if it did?

A. I am responsible for the initiation and conduct of research. I employed the research men. I order or have ordered, that is, issue the orders under which the research work is done; order the materials, pass on the bills; and got a statement at the end of each month of the cost of research on each problem.

Q. 33. Now, you may state, Dr. Crossley, the

amount of cost of research work that you have described on procaine?

A. The cost approximately, within my knowledge, that is, of the research within my knowledge, which does not include additional for overhead, over which I have no control, was approximately between forty-five and fifty thousand dollars.

Q. 34. And what was the cost of the research work on neocinchophen?

A. Between twenty-five and thirty thousand dollars.

Q. 35. And what was the cost of the research work that you have described on cinchophen?

A. About sixty thousand dollars.

Q. 36. Dr. Crossley, were you in court yesterday when Dr. Bolton testified?

A. Yes.

Q. 37. Did your company ever succeed in producing procaine for sale?

A. No. May I qualify that statement?

Q. 38. Certainly.

A. Our company worked out a process after four years which was satisfactory as a laboratory process. It was never introduced in the plant for two reasons: First, because it was quite evident that there were at that time too many others manufacturing the same product, and as a business policy we decided not to go into it. The second reason was, we had developed a product which we believed better for many purposes as a local anæsthetic than procaine.

Q. 39. And what was the name of that product?

A. That product is registered under the trade name "salicaine."

Q. 40. Used as a local anæsthetic?

A. Used as a local anæsthetic.

Q. 41. As novocaine was used?

A. Yes.

Q. 42. And when did your company first produce that salicaine, if that is the name of it?

A. We first produced it in 1921, as a laboratory product.

Q. 43. Yesterday, counsel for the Government, in questioning Dr. Bolton—I may not quote his exact words — asked, substantially, whether the Germans were not the pioneers in the dyes industry or the dyes business. Doctor, I am interested to know if you can tell us who first discovered the aniline dyes?

A. Chemical history is quite clear on that point. The English and French were the pioneers, both in discovery and application of synthetic dyes. Sir William Henry Perkin discovered the first synthetic dye in 1856. That was mauve, sometimes called mauvine. The period of ten years thereafter is marked by very notable discoveries of English and French scientists of some of the products which are of prime importance today. I may mention only a few to illustrate my remark. Magenta was discovered in 1859 by a Frenchman, Verguin, and in 1860 a very marked improvement in that process was discovered by Nicholson, an Englishman. Then, in 1860, the first synthetic blue dye was discovered by Girard and DeLair, both Frenchman. Then aniline black, by Lightfoot, an Englishman, in 1862; and aniline black today is still one of our very staple products. Then the first green dye, aldehylo green, in 1862 by Chepin, and safranine by Duprey in 1865, and soluble indulines by Coupaier, a Frenchman, in 1862. It was not until after 1860, about 1860. when Hoffmann began his work, that Germans had contributed at all.

Q. 45. Hoffmann was a German chemist?

A. Hoffmann was a German chemist.

Q. 46. One of the most famous, was he not?

A. One of the most famous German chemists; and then, most all of these products that I have mentioned

were put into operation in England and France as manufacturing products.

Q. 47. Before I go into another subject with you, Doctor, I would like you to state whether you have any knowledge as to the availability of dye plants for the manufacture of munitions and vice versa; and if you have, to please state an example of more than one?

THE COURT: Have you not covered that by six witnesses already?

MR. KRESEL: By how many—no, your Honor.

THE COURT: I will take the answer.

A. I have.

MR. KRESEL: I think this is the second witness I have asked that question.

Q. 48. And what is your knowledge as to that?

A. We built a plant, that is, the Calco Chemical Company built a plant during the war to make tetranitroanilin, one of the most powerful of the explosives. The plant is today in operation making intermediates, without any change having been made in it, and is ready to start at any moment to make the same explosive.

Q. 49. Intermediates for what?

A. Intermediates for dyes. I might add that the chief intermediate used in the manufacture of this explosive is also a very important intermediate in the manufacture of a number of dyes.

Q. 50. And what intermediate do you refer to?

A. I refer to dinitrobenzene.

Q. 51. Doctor, have you been experimenting with any of the German patents covering dyes?

A. I have.

Q. 52. I am going to ask you, without putting too many questions, if counsel will permit, to state what patents you have been experimenting with, for how

long a period your experiments lasted, what you did, and what the result was that you obtained?

MR. ANDERSON: My objecting or not objecting to that question will depend on the character of the answer, so that reserves the right on direct, to stop the witness at any time.

MR. KRESEL: You may stop him if you think I had better put the specific questions.

THE COURT: Do not let him go on and then move to strike it out.

MR. ANDERSON: No. I will try to stop him if I see he is going where I do not think he has a right to.

Q. 53. All right. Proceed, Doctor.

A. Please read the question.

(Q. 52 repeated as recorded.)

A. Specifically patent No. 733,280.

Q. 54. Will you state the product that covers.

A. Covering an azo dye known in the trade as Lake Red C.

Q. 55. As you speak of those, will you please produce copies of the patents, if you have them?

A. This is patent No. 733,280 (handing).

Q. 56. Now go ahead.

A. And patent 1,063,173, dealing with the preparation of beta-aminoanthraquinone, used as an intermediate for the manufacture of vat dyes.

Q. 57. Yes.

A. Patents 682,523; 724,789; 739,145, dealing with preparation of indanthrene dyes.

Q. 58. Now, if you can, please state what you did with reference to each of these patents and the results you obtained?

A. I worked personally and with assistants in the universities I have mentioned, over a period extending from 1908 to 1918 on some of these patents,

on all that I have mentioned that I have given you in that period. My purpose was primarily to get an idea of the——

Mr. Anderson: If your Honor please, we want to know exactly what he did.

Mr. Kressel: Strike out from the words, "My purpose."

A. (Continuing.) I followed the description in each of the patents in detail.

Q. 59. Now, taking up patent No. 733,280, covering the red azo dye, what result did you obtain?

A. I obtained a mixture of at least two dyes, which was not Lake Red C, as known in the trade.

Q. 60. Was the mixture of any commercial use?

A. The mixture was not of commercial use. Lake Red C is of commercial use, because of its brilliancy as a lithographic pigment, or as a pigment for lithographic ink. The product obtained by means of following the details of the patent is a brownish red pigment, which, in technical language "bleeds" in the oil, and is not satisfactory as an ink.

Q. 61. Now, take up patent No. 1,063,173 of the beta-amino-anthraquinone, what result did you obtain there?

A. I obtained, by following the patent describing explicitly a mixture of beta-amino-anthraquinone and impurities which was not suitable as a commercial product or for the manufacture of the dyes resulting therefrom.

Q. 62. Please look at this particular patent covering beta-amino-anthraquinone, and state whether there are any directions there with reference to oxidizing agents?

A. Yes, there are.

Q. 63. Well, did you follow out those steps?

A. Yes.

Q. 64. And what did you find with reference to the utility of those oxidizing agents?

A. I found that the product obtained with the oxidizing agents was more impure than the product obtained without them.

Q. 65. Will you proceed to state what result you obtained in following out the processes described in patent No. 682,523?

A. That is the patent on Indanthrene Blue RS. I obtained a mixture of products not suitable for the purpose for which Indanthrene Blue RS had been used.

Q. 66. Could those impurities be removed?

A. Not practically.

Q. 67. Was the product that you obtained a commercial product, salable?

A. It was not.

Q. 68. You also mentioned patent No. 724,769. Is that a patent covering the same product?

A. It is a patent which covers the same product.

Q. 69. Is it a later patent or a preceding patent?

A. It is a later patent. It was taken out, if I recall correctly, in 1903, while the other patent was taken out in 1901.

Q. 70. Was it taken out by the same inventor?

A. It was.

Q. 71. I would like you to take the two patents, and, having now described the results that you obtained under the first one, I am going to ask you to state whether the second one in language recognizes the inability to produce under the first one.

Mr. Anderson: That is a pure construction of the instrument, sir.

Mr. Kresel: I am going to ask him to read it.

Mr. Anderson: He can read the instrument to the Court.

Mr. Kresel: I do not want him to read the whole instrument.

MR. ANDERSON: I object to his construction of the language of the instrument.

THE COURT: That is not the purpose. I will let you read it, Mr. Kresel, if you want to.

MR. KRESEL: All right; I will ask the witness to point it out to me because I am not as familiar with it as he is.

THE COURT: Is this in evidence?

MR. KRESEL: I have not yet put them in evidence, your Honor. I thought I would put them in together. If it be better, I will offer them now.

I offer first the patent No. 733,280, on the Red Azo dye.

Received in evidence and marked "Defendant's Exhibit No. 281." (*See Patent Exhibit Book.*)

MR. KRESEL: I next offer patent No. 1,063,-173, covering beta-amino-anthraquinone.

Received in evidence and marked "Defendant's Exhibit No. 282." (*See Patent Exhibit Book.*)

MR. KRESEL: Now, I offer the two patents, to wit, No. 682,523 and No. 724,789, covering——

Q. 72. What was that dye you spoke of?

A. These two patents cover the same product.

Q. 73. Yes, but what is it?

A. Indanthrene Blue RS.

Received in evidence and marked, respectively, as follows: Patent No. 682,523, "Defendant's Exhibit No. 283"; Patent No. 724,789, "Defendant's Exhibit No. 284." (*See Patent Exhibit Book.*)

Q. 74. I am going to ask you to point that out to me again.

A. (Witness indicates on patent.)

MR. KRESEL: I read from patent No. 724,789 the following statement: "My invention relates

to developments and improvements of the invention patented to me by Letters Patent No. 682,523, September 10, 1901. I have found that the coloring matter obtained as described in the specification of the said Letters Patent is not always of a homogeneous character, but may consist of or contain bodies which I will refer to as A and B, and these can be separated from one another by suitable means; and the final object of my present invention is the production of the two bodies A and B in a commercially-pure state and either in their reduced or in their unreduced form."

Q. 75. I would like you to state, Dr. Crossley, whether you experimented under the later patent as well as under the prior one?

A. I did.

Q. 76. And you have, I think, already told us the results obtained under the prior patent. What results did you obtain under the later patent, which is No. 724,789?

A. The results are an A product which can be purified, a B product as described there, which is not a dye.

Q. 77. Not a dye?

A. Yes. In the scientific sense of the word it is a mixture of very low tinctorial power.

Q. 78. Is either product that you were able to obtain under the later patent of commercial use?

A. Neither product is of commercial use as obtained by the description in the patent.

Q. 79. Did you undertake experiments under a patent covering Indanthrene Yellow?

A. I did. That is patent No. 739,145. The product is also known under the name of flavanthrene.

Q. 80. When did you experiment with that?

A. My work on that patent began about 1911, if I remember correctly.

Q. 81. And for how long a period did you work on it?

A. Between 1911 and 1914.

Q. 82. What did you do?

A. I followed the patent description in detail.

Q. 83. What result did you obtain?

A. For the most part obtained a mixture of products which was not of commercial importance.

Q. 84. Was the mixture that you obtained such as could be used commercially?

A. Only in one instance.

Q. 85. And what was that?

A. That was in following a chance remark in one of the last paragraphs of the patent, with respect to the use of a particular reagent which is mentioned casually as being suitable for substitution for the one required in the specification.

Q. 86. I wish you would point that out.

THE COURT: Is this the same patent with respect to which Dr. Bolton testified?

MR. KRESEL: I think so. I would like to find out if patent No. 739,145 is in evidence. I think it is.

A. That is on page 2 of the patent, in line 26.

Q. 87. Will you read it, please?

A. It says: "Instead of employing aluminum chlorid as condensing agent I can use antimony pentachlorid in the presence of a suitable solvent.

MR. KRESEL: There is some doubt, your Honor, whether the patent is already in, and I will offer it with the understanding if it is in, of course, it need not be printed twice. I therefore offer patent No. 739,145.

Received in evidence and marked "Defendant's Exhibit No. 285." (*See Patent Exhibit Book.*)

MR. KRESEL: Colonel, the witness is yours.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 88. Is the Calco Company manufacturing dyes?

A. Yes.

XQ. 89. How long has it been manufacturing dyes?

A. Since 1916.

XQ. 90. Is it producing the dye that you described under patent No. 739,145?

A. It is not.

XQ. 91. Not producing it at all?

A. It is not.

XQ. 92. Did you ever try to produce it at the Calco Company's plant?

A. I did not.

XQ. 93. Where did you try to produce it?

A. At Wesleyan University, at Middletown, Connecticut.

XQ. 94. You said that you worked on it between 1911 and 1915?

A. 1913, I think I said.

XQ. 95. 1913?

A. Yes.

XQ. 96. How much time did you actually devote to this particular work?

A. I wish to correct my statement there. I said at Wesleyan University, but I should have said William Jewell College.

XQ. 97. Where is that?

A. That is at Liberty, Missouri.

XQ. 98. How much time did you actually devote to the work under this patent?

A. I devoted all the time when I was not teaching, and I taught.

XQ. 99. You taught?

A. Yes.

XQ. 100. Did you carry on any other experimental work between 1911 and 1913?

A. I did not. I taught at William Jewell eight hours a week.

XQ. 101. Eight hours a week?

A. Eight lecture hours a week.

XQ. 102. And your other time was devoted to experimenting with this patent?

A. Yes.

XQ. 103. How many assistants did you have?

A. I had three, two graduate assistants and one under-graduate.

XQ. 104. You did produce under that patent by following the clause which you referred to and read to the Court, the product called for by the patent, and in commercial quality, did you?

A. I produced a product which could be sold as a commercial product after purification.

XQ. 105. You said that for the most part you obtained a mixture which was not of commercial importance, but that you did produce a commercial product following what you call a chance remark; is that a correct statement of your evidence?

A. That is right.

XQ. 106. During the period of your two years' experimentation did you follow in every instance the details of the formula set out in the patent?

A. I first followed every detail in the patent; yes, sir.

XQ. 107. In every instance of your experimentation?

A. Yes.

XQ. 108. Did you vary in any way from the patent?

A. I did not.

XQ. 109. In every instance you stuck exactly to the patent?

A. I did.

XQ. 110. How many illustrations or suggested formulæ are there in that patent?

MR. KRESEL: Would your Honor permit me about two minutes—will you stop for a few minutes? I won't be more than that.

THE COURT: Yes.

MR. KRESEL: Thank you.

(Counsel consults with associates.)

XQ. 111. How many times did you work through each of the examples illustrated in the patent?

A. I cannot state exactly, but very many times.

XQ. 112. I think I will ask you to take that patent and read over the first illustration and state exactly what you did in each step?

MR. KRESEL: Which patent is it?

MR. ANDERSON: The patent No. 739,145. What is the date of it, by the way?

MR. KRESEL: The date is September 15, 1903 (handing witness patent).

MR. ANDERSON: I do not think I will take up the time with that. It expired in 1920, anyhow.

MR. KRESEL: The question is withdrawn.

MR. ANDERSON: Yes.

XQ. 113. You testified as to patent No. 682,523, did you not?

A. I think so.

XQ. 114. Read the date of it.

A. 1901, I think.

XQ. 115. What month?

A. September, 1901.

XQ. 116. It expired in 1918, in September, did it not?

A. The first patent taken out by Rene Bohn, of Mannheim, on indanthrene dyes.

MR. ANDERSON: I move to strike out all evidence as to that patent. It was not assigned to The Chemical Foundation at all. It had expired before the assignment took place.

MR. KRESEL: I do not know whether it was actually assigned or no.

MR. ANDERSON: Of course, it may have been assigned.

MR. KRESEL: Oh, there were at least 54 assigned that had expired, as we showed by Mr. Garvan's testimony.

MR. ANDERSON: I am glad to get that information.

MR. KRESEL: You are glad to get it? You had it three weeks now.

THE COURT: The only value that would have, with respect to that patent, would be to identify the particular processes which this witness was using, so as to show whether he was a person skilled in the art covered by the allied patents.

MR. KRESEL: And, moreover, sir; it is connected with the second patent by the same inventor, as to both of which, you will recall, he testified.

XQ. 117. What is the date of the second patent dealing with that subject?

A. 1903.

XQ. 118. What month?

A. Dated in April, 1903.

XQ. 119. And expired in April, 1920, did it not?

A. (None).

XQ. 120. When did you make the experiments with those two patents?

A. My experiments really began much earlier. They began in 1908.

XQ. 121. Your experiments with these two patents began in 1908?

A. I cannot say they concerned only those two patents from 1908 on.

XQ. 122. I would like to know just when and where you did experiment with those two patents?

A. With those two patents I experimented both at William Jewell College and Wesleyan University between the years 1911 and 1918.

XQ. 123. Can you not locate the date more accurately than that, of these experiments?

A. I cannot say definitely that I experimented with one or the other of the two patents at any particular time, because I was a scientific investigator, with the purpose of finding data concerning the mechanism of reaction.

XQ. 124. We do not want any of the causes. I asked you whether you could locate more accurately the time of your experimentation with these patents—more accurately than from 1908 to 1913?

A. I told you on one patent I was confined entirely between 1911 and 1913.

XQ. 125. We have dropped that one. I am talking about these two.

A. May I see the patents?

XQ. 126. Yes (handing witness patents).

A. On the beta-amino-anthraquinone patent my work was between 1913 and 1915. On patent No. 724,789 my work was chiefly between 1914 and 1916.

XQ. 127. And you cannot locate it any more accurately than that?

A. I cannot.

XQ. 128. I will ask you to state how much time you devoted to the experimentation on each of these patents—actually the time. I am now speaking of the two patents dealing with the Blue RS, the Indanthrene

Blue RS, No. 682,523, which expired in 1918, and No. 724,789, which expired in April of 1920.

A. As a rough estimate I would say that I gave about ten to fifteen hours a week.

XQ. 129. As a rough estimate?

A. Yes, sir.

XQ. 130. And you canot locate the time in which you gave this work any more than between 1913 and 1915—or 1914 and 1916?

A. I cannot.

XQ. 131. Did you do any other scientific experimental work during this period of two years?

A. During the latter period I did. I worked on the intermediate from which later beta-amino-anthraquinone was made.

XQ. 131-a. Referring to patent No. 682,523 and patent No. 724,789, how many times did you follow through the details of the formulæ prescribed in those patents?

A. A great many times.

XQ. 132. Can you give me any idea what you mean by "a great many"?

A. In one particular case I would estimate that the number of experiments carried out during the period of two years was about one hundred.

XQ. 133. In which particular case is that?

A. That is in the first patent.

XQ. 134. That is in the old patent that expired in 1918?

A. Right.

XQ. 135. How many times did you go through the various formulæ prescribed in the second patent?

A. Roughly, I would estimate seventy-five times.

XQ. 136. Did you follow that formulæ in detail every time?

A. I followed it in detail until I found modifications necessary, perhaps.

XQ. 137. What modification did you find necessary? Now we are getting to the interesting part.

A. I do not feel that I can answer that question without jeopardizing information which is secret to other companies.

XQ. 138. What companies?

A. The companies that are making indanthrene dyes, which might discover the same information.

XQ. 139. Do you know whether those companies are following your experience?

A. I do not.

XQ. 140. Would you name some company that is following your experience and the results of your experiments?

A. There is no company that I know of following my experiments. My experiments are not published.

XQ. 141. Then I renew my question.

MR. KRESEL: Wait a minute; pardon me; had you finished your answer?

THE WITNESS: I have not.

A. (Continued.) By giving that information I would undoubtedly, as a scientific man, be giving information that others working in the same field had discovered.

XQ. 142. And the patent has expired three years ago?

A. It has; but that information has not expired.

XQ. 143. You would be giving information of others by giving the modification that you made in the processes defined in this patent; is that it?

A. Undoubtedly. I can give one, because that is public knowledge. The first patent fails to state——

XQ. 144. No, I am asking about the second patent. The first patent expired before this transfer.

A. Well, the second patent——

THE COURT: Both of these patents are embraced in the assignment of December 10, 1918.

MR. ANDERSON: Yes, sir. That being the case, the patent had expired, and being named in there, would make it of no consideration in this case.

MR. KRESEL: But you claimed they were worth a million dollars apiece, did you not?

MR. ANDERSON: No, I did not say they were worth a million dollars apiece, these particular patents.

THE WITNESS: The remark I was about to make applies to the second patent as well.

XQ. 145. All right, let us have exactly the variation.

A. The conditions under which the fusion is made are conditions which produce, in adition to the blue dye and the impurity, alizarin, and alizarin decomposes at the temperature of this reaction to form a brown product which contaminates the reaction product and makes it very difficult to separate it.

XQ. 146. Then I will ask you to read the provision that you refer to from the example in which it is included, and state exactly what the patent calls for, and state exactly the variation that you made in detail.

A. The patent, in specification No. 2, which calls for production of a melt from which A is the chief product obtained, states——

XQ. 147. State the process.

A. "Heat a mixture of ten parts of beta-aminoanthraquinone, twenty to fifty parts of potassium hydrate and two parts of potassium nitrate to a temperature of two hundred degres centigrade. Raise the temperature gradually to two hundred and fifty degrees centigrade and maintain this temperature for half an hour. Pour the melt into water and boil up

in the presence of air. The chief product of the reaction is A. Small quantities of B that may be formed can be separated in the manner described in Example 1."

The modification which I found necessary in this particular specification in order to get A in any satisfactory quantity was to increase the initial temperature from 200 to 230 degrees, at which point practically no alizarine is formed, and the brown by-product which is so difficult to separate is thereby eliminated. That was a very important point, and the second important point is that the amount of sodium nitrate——

By The Court:

Q. 148. Are you proceeding to give information which is public?

A. This information is public.

The Court: I will pass upon the other when I reach that point, if you press your objection.

A. (Continuing.) The second point is that the amount of nitrate mentioned in the specification is not sufficient for the complete oxidation, and I found it necessary to increase that amount.

XQ. 149. How much did you increase it?

A. I increased it from two to five parts.

XQ. 150. That is the only variation that you made in that process?

A. That is the only variation which I am at liberty to give; yes.

XQ. 151. Then I understand that you raised the temperature from 200 to 230 degrees?

A. Initial temperature.

XQ. 152. And that you used more nitric acid than that called for by the patent?

A. Potassium nitrate.

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A. Initial temperature.

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A. Potassium nitrate.

XQ. 153. In that example it is stated that by

following the terms of the example, you get small quantities of the product B named in the patent. Did you find that was true?

A. I did, but in addition to the small quantities——

XQ. 154. I asked you if you got the small quantities of B?

A. I got the small quantities of B.

XQ. 155. Did you undertake to separate those small quanties of B in the manner described in Example 1?

A. I did.

XQ. 156. Did you separate them?

A. I did not.

XQ. 157. Then your difficulty was that you did not get the separation provided in Example 1, and you raised the initial temperature from 200 to 230 degrees. Did you raise the subsequent temperature above 250 degrees?

A. I did not.

XQ. 158. So that as to temperature it was merely a question of starting at a little higher temperature and going up 20 degrees to 250, instead of starting at 200 and going up 50 degrees to 250?

A. A very important point.

XQ. 159. I mean, that is all the variation you made?

A. Yes.

THE COURT: Will you read me the provision of the patent with respect to that, Colonel Anderson?

MR. ANDERSON: "Heat a mixture of ten parts of beta-amino-anthraquinone, 20 to 50 parts of potassium hydrate, and two parts of potassium nitrate to a temperature of 200 degrees centigrade. Raise the temperature gradually to 250

degrees centigrade and maintain this temperature for half an hour. Pour the melt into water and boil up in the presence of air."

THE COURT: That gives me all I want. Thank you very much.

MR. ANDERSON: To finish up, if you will allow: "The chief product of the reaction is A."

XQ. 160. That was a fact; the chief product was A, was it not?

A. Yes.

MR. ANDERSON: "Small quantities of B that may be formed can be separated in the manner described in Example 1."

XQ. 161. Did you try the other examples set forth in that patent?

A. I did.

XQ. 162. Did you modify those examples in any respect?

A. Only insofar as my experience with the first example dictated.

XQ. 163. Take the other examples and see what they called for and to what extent you modified them and in what respect, exactly.

A. Example 3 calls for the production of a melt from which B is the chief product obtained. In my previous example I had found that B was not of much value, but I wanted to test the patent for scientific accuracy. It calls for mixing ten parts of beta-amino-anthraquinone, fifty parts of potassium hydrate, and twenty-five parts of absolute ethyl alcohol.

"Heat the mixture for about three hours at from 140 degrees to 150 degrees Centigrade. Pour the melt into water in the presence of air and filter off the dark-blue precipitate formed. The chief product is B. Small quantities of A that may be formed can be separated as explained in Example 1."

In view of the fact that alcohol under these conditions of the experiment has to be carried under pressure, and the example says absolutely nothing about it, I found it necessary to lower the initial tempature at which the reaction was carried from 140 degrees to 110 degrees and the final temperature at which I finished was 140 degrees instead of 150 degrees.

XQ. 164. Ten degrees less; that was all the variation you made, was it?

A. That was all the variation in that particular example.

XQ. 165. As a chemist, did you not know as a matter of common knowledge that alcohol under those conditions would have to be used under pressure?

A. I would have accepted it, yes.

XQ. 166. Is there any other example in this patent?

A. Not dealing with that.

XQ. 167. Those are all the variations that you made from the patent, as you have indicated, are they?

A. They are all I am at liberty to give.

XQ. 168. Then I want to get the others. I will ask you to take the patent and state exactly what other, if any, variations you made from the formula therein described?

THE COURT: You need not answer, Doctor. I think that is immaterial. This witness has testified under oath that that patent does not produce a commercial result when its terms are followed. He has indicated some of the variations. He need not indicate the others, because the variations are irrelevant and immaterial to the issues of this case. He has told you the amount of time that he spent in perfecting a commercial product, starting with this patent. I am not concerned as to the extent of the variation of that process. I am

concerned as to the disclosures of this patent and the time and money necessary to be expended in perfecting the process.

What this man reached may not have been the result reached by any one else under the patent. I think it is irrelevant and immaterial; and whether it embodies a trade secret in the specific sense or not, it does embody the disclosure, obtained by a large expenditure of money, on the part of this witness, and the result of that labor is a personal asset which I shall not ask him to discard in this case, because in my view, it is irrelevant and immaterial to any issue, howsoever remote, involved in the trial of this case. You may have an exception.

MR. ANDERSON: I will note an exception.

XQ. 169. What commercial experience had you had prior to 1918?

A. I was consulting Chemist for the Barrett Company from 1916 to 1918. Prior to that time I had done a considerable amount of consulting work in various branches of the industry. I had been a consultant for two or three soap manufacturing companies; also for the New England Enamel Company and several others.

XQ. 170. You had never operated any manufacturing plant yourself?

A. I had not.

XQ. 171. You had never been in the mercantile business or trade at all, had you?

A. I had not.

XQ. 172. Is the Calco Chemical Company now making the intermediate covered by patent 1,063,173; that is this patent (handing patent)?

A. It is not.

XQ. 173. Have you at any time ever engaged in the manufacture of that product on an industrial scale?

A. I have not.

XQ. 174. Is your knowledge thereof and your testimony thereon with relation entirely to your laboratory experiments?

A. It is.

XQ. 175. At what time did you say that those experiments took place under that particular patent?

A. 1913 to 1915.

XQ. 176. You were then at Jewell College, Missouri, you said?

A. 1913 to 1915, I was part of the time at William Jewell and part of the time at Wesleyan.

XQ. 177. I believe you said the Calco Company was not manufacturing novocain?

A. It is not.

XQ. 178. I believe you said that it worked out the process which produced novocain in a satisfactory quantity and character, but for business reasons it was never introduced into the plant; is that true?

A. That is correct.

XQ. 179. Do you know whether it holds a license for the manufacture of novocain?

A. It did, until the patent ran out. I am not certain which preceded. The license was cancelled.

XQ. 180. That ran out this year, did it not?

A. The license was cancelled.

XQ. 181. The patent ran out this year. When did it start to produce the drug which you described as a substitute in action?

A. On a laboratory scale, the production began late in 1921. It is still, of course, in what we call the pilot plant stage, that is, small producton of the product.

XQ. 182. Is it now a commercial product?

A. It is, for certain classes of work.

XQ. 183. State what you mean by "certain classes of work"?

A. It is particularly useful in cystiscopic work, that is, anaesthesia of the bladder and the organs connected therewith.

XQ. 184. How long has it been on the market commercially; I mean, how long has it been sold?

A. For about a year, some time during 1922. It was furnished to physicians in 1921, but not to any large degree. It was accepted by the Council on Pharmacy in 1921.

MR. ANDERSON: I have to ask a question, sir, which I know goes against your ruling, but I will ask it.

THE COURT: Some questions can be asked there, Colonel Anderson, which I would let in. There are certain questions that I will not let in. You may ask them——

MR. ANDERSON: And I will ask the witness not to answer until—I do not want to talk against your Honor's ruling.

XQ. 185. I will ask you to state first, whether the substance which you mentioned as a substitute, is covered by a patent?

A. It is not. The substance I have mentioned is not new. It is a well-known product——

MR. ANDERSON: I only asked you, Doctor, if it was covered by a patent.

THE WITNESS: It is not.

MR. ANDERSON: That is all. May I strike out the balance?

THE COURT: Yes.

XQ. 186. Now, I would ask you to state specifically how this substitute remedy is made?

A. I cannot answer that.

THE COURT: That comes under the rule. It seems to me wholly unnecessary, but I am not going to substitute my dictum for yours. I am only going to make a ruling. It seems to me you can

get what you want without coming in conflict with that ruling in this instance; but as to this I rule that he need not answer that question for the reasons indicated yesterday and today.

MR. ANDERSON: I will note an exception, sir.

XQ. 187. Now, I will ask you to state whether you, in your experiments for the manufacture of procaine or novocain under Patent 812,554 followed in detail the specifications of the patents?

A. I did.

MR. ANDERSON: Let me have those, will you please?

MR. KRESEL: It is not one of those photostats.

THE CLERK: No. 155.

XQ. 188. There is only one other process outlined in that patent, is there not, one example?

A. Yes, sir.

XQ. 189. And you followed that in detail, did you?

A. Yes.

XQ. 190. Now you say you finally produced a satisfactory product?

A. We did.

XQ. 191. I will ask you to state exactly the variations from the specification in that patent that you followed when you produced a satisfactory product?

A. I cannot give that without giving secret information.

THE COURT: That is immaterial. The length of time that was required may be ascertained; you may go into that as fully as you like; the length of time before that was done; the number of chemists that were employed; the skill of those chemists; their training; the expenditure of money; the development or lack of development of apparatus necessary to carry into effect the process of the patent; but I see no value that the

secret processes or the product ultimately developed, will have upon the issues in this case.

MR. ANDERSON: Your Hnoor will allow me an exception, of course.

THE COURT: Yes.

MR. ANDERSON: I will lay that point aside for a moment.

XQ. 192. Now, under the two patents covering cinchophen and neocinchophen——

THE COURT: May I add this, before you ask that question. I will make this other suggestion. You may put on any witnesses that you like, up to the number limited by the rule, which is six, to show that this commercial product may be obtained readily by following the process of the patent, and that will be affirmative testimony and also negative, and I shall be very glad to have them. Also I shall be very glad to have you demonstrate in court the making of any of these products in conformity with the process of the patents.

MR. ANDERSON: I have inquired into that, sir. I am told that these are all complicated processes and require time not only for the mixing of the ingredients, but for the reactions, and for heating and cooling, which would take quite a considerable time, and therefore it is not possible.

THE COURT: Then, you may have this opportunity: We will asign to you a room in the building where your chemists, with the chemists selected by the defendant, as observers, may make the products of any of these patents, or all of them, and at the conclusion of their experiments, we will take the testimony of your chemists, and allow them to develop them.

MR. KRESEL: That is an excellent suggestion your Honor. I am very glad your Honor made it.

MR. ANDERSON: The only available material as regards chemists, will be glad to make any experiments along those lines, but I venture to suggest, without at all arguing against your Honor's ruling, which I accept——

THE COURT: It is not a ruling.

MR. ANDERSON: I think that does not relieve the question of the disabilities on cross-examination which this ruling imposes. I bow to the ruling with all deference, and say it is a question which deserves serious consideration, and I reserve the point on the record.

THE COURT: You may have your exception, but so far as the disclosure of the secrets in any instance called for by you, that is a matter of exception, and in disposing of that matter, I wanted merely to indicate that my ruling did not go so far as to deprive you of the opportunities mentioned at the time, including the right to demonstrate the workability—for the want of a better term—of any patent assigned to The Chemical Foundation, Inc. That is not an invitation for you to do it. I only wanted you to know that you have that opportunity if you want it.

XQ. 193. Before taking up the patents last mentioned, I would like to ask you as to the items of expense of the Calco Chemical Company in the investigations to which you have referred, of cinchophen, neoconchophen and novocain. At what time were those investigations made?

A. The investigation on cinchophen started early in 1917. The work on neocinchophen started in 1918, procaine started in 1918, and continued for four years thereafter.

XQ. 194. At what time did you become connected with the Calco Chemical Company?

A. July, 1918.

XQ. 195. Were these experiments or researches then in progress?

A. That on cinchophen only.

XQ. 196. What was your position with the Calco Chemical Company when you first went there?

A. I went there as chief chemist.

XQ. 197. You have continued to occupy that position up to the present time?

A. I have.

XQ. 198. And you know of your own knowledge the aggregate expenditures on these investigations over the period of four years?

A. I do.

XQ. 199. And you can now testify as to those figures?

A. I can.

XQ. 200. What were the expenditures in the year 1918?

A. I cannot tell you.

XQ. 201. Are you speaking of your own knowledge of these expenditures, or are you speaking from information derived from the accounts?

A. I am speaking from my own knowledge. The figures given are estimates of my knowledge of the figures that come within my responsibility.

XQ. 202. What are the figures that come within your responsibility?

A. The figures for chemists' time, material, and labor wherein that is involved.

XQ. 203. How much overhead is charged in the $45,000?

A. I do not know that figure.

MR. KRESEL: He has expressly said that he did not include overhead.

MR. ANDERSON: I beg your pardon; he said he did not know the figure.

MR. KRESEL: What is that?

MR. ANDERSON: I think this witness can answer these questions, sir, without assistance.

XQ. 204. I will ask you next how many pharmaceutical products the Calco Chemical Company turn out or produce?

A. We produce very few pharmaceutical products. I think about four.

XQ. 205. The larger part of your plant, then, is devoted to what?

A. The manufacture of intermediates.

XQ. 206. Of intermediates for the manufacture of dyes, is that it?

A. Yes.

XQ. 207. And you can check the laboratory expense without going back to the books, and divide it up over a period of four years between such laboratory research as applied to dyes and intermediates and such as applied to cinchophen and neocinchophen and procaine, and state what part of such expense was chargeable to the research for those three drugs; you can do that?

A. I can, because each particular problem is handled under a specific research number, and nothing but what is directly chargeable to that number goes against it.

XQ. 208. How do you know that?

A. Because by specific orders, the order number is assigned to the particular problem on which a particular man works, and he works on nothing else until that problem is through.

XQ. 209. When you say that nothing else is charged against them, do you know anything about the accounts of the company?

A. I am speaking of the charges for which I am responsible.

XQ. 210. When you get through with those sheets that you speak of, where do they go?

A. Those are records in my files.

XQ. 211. Who keeps the accounts? Have you an accounting department?

A. Oh, yes; our accounting department, of course, takes care of all accounts.

XQ. 212. You have not consulted your accounting department at all in arriving at these figures, have you, of cost?

A. The accounting department is not concerned with keeping accounts on specific research problems.

XQ. 213. I would like you to answer the question, please?

A. I have not consulted the accounting department.

XQ. 214. And you came over here to testify in this case; you are not under subpoena, are you?

A. I am not.

XQ. 215. You came here by direction of the Calco Chemical Company or its officers?

A. I came here voluntarily.

XQ. 216. I beg your pardon?

A. I came here voluntarily, yes.

XQ. 217. And you came over to testify on the question of these particular drugs, knowing that you were going to testify as to cost, and did not consult the accounting department at all to find out what it did cost, is that it?

A. I did not.

XQ. 218. You mean that you did not consult them, or that you did not come to testify about these questions?

A. I did not consult them.

XQ. 219. Did you or did you not come here by direction of the officers of your company?

A. I did not.

XQ. 220. Did you or did you not come here with their knowledge?

A. I came here with their knowledge.

XQ. 221. What intermediate dyes does the Calco Chemical Company manufacture?

A. What intermediates, did you ask?

XQ. 222. Yes.

A. We manufacture beta-naphthol, aniline, aniline salt, sulphanilic acid, dinitratebenzene, metaphenylenediamine, dimethylaniline. Those are all I recall just now.

XQ. 223. Are the patents which you put in evidence this morning relating to dyes the only alien patents owned by The Chemical Foundation under which your company operates or holds a license?

A. They are.

XQ. 224. They are the only ones?

A. I beg your pardon—our license includes other patents, but we have not used them.

XQ. 225. The license includes other patents, does it, than these?

A. Other patents on the same drugs. The license includes patents Nos. 1,045,759, 1,075,171, 1,086,681, 1,181,485 and 1,197,462; but the other patents we have not even examined.

XQ. 226. And they refer to what drug?

A. They refer to cinchophen.

XQ. 227. And neocinchophen?

A. Cinchophen and derivatives of cinchophen.

XQ. 228. That includes neocinchophen, does it?

A. One of these patents includes neochinchophen. It is one to which I have already referred.

XQ. 229. And are there any other patents which refer to the drug novocain that you know of?

A. None that I recall.

XQ. 230. Or procaine?

A. None that I recall at present, no.

XQ. 231. Are there any other patents included

in your license with respect to dye intermediates or products?

A. None.

XQ. 232. Do you know whether there are any other patents relating to those dye intermediates or products held by The Chemical Foundation?

A. None.

XQ. 233. Have you ever investigated that?

A. Yes, we have.

XQ. 234. And you do not find any of those?

A. No.

XQ. 235. Did you get that information from the publication issued by The Chemical Foundation?

A. I did.

XQ. 236. Did you examine the patents themselves?

A. I did.

XQ. 237. You examined all the patents covered by that publication?

A. Yes; the products we make are chiefly staple products of long standing, none of which are covered by patents today.

XQ. 238. Most of them are not covered by patents?

A. Those that are new are products of our own discovery and are either covered by our own applications for patents or covered by our own secret information.

XQ. 239. You do manufacture, however, this intermediate covered by patent number 1,063,173, at the present time?

A. I do not know what that patent covers.

XQ. 240. That is that beta—whatever you called it?

A. Beta-amino-anthraquinone. No, we do not manufacture it.

XQ. 241. Have you ever manufactured it at all?

A. No, we have never manufactured it at all.

XQ. 242. I believe you said you did produce it, however?

A. We have never produced it.

XQ. 243. The Calco Chemical Company has never produced it?

A. I think I answered the question once before that I had only——

XQ. 244. I had overlooked it, Doctor, if you did.

A. I had only prepared it in the laboratory.

XQ. 245. There are so many things that I get mixed up over them.

A. Yes.

XQ. 246. Do you produce any of these dye intermediates as to which you have produced patents here?

A. We do not produce any intermediates under patents. We produce under the patents which have been admitted, cinchophen and neocinchophen, which are drugs.

XQ. 247. You do produce those?

A. Yes.

XQ. 248. And you sell those under the license?

A. And sell them under the licenses of The Chemical Foundation.

XQ. 249. That is cinchophen and neocinchophen?

A. That is cinchophen and neocinchophen.

XQ. 250. But as to the patents under which you hold licenses for the manufacture of dyes or intermediates, you are not paying any license fees or royalties?

A. We hold no licenses for patents on dyes and intermediates.

XQ. 251. Do you manufacture any substitutes for the intermediate covered by this patent No. 1,063,173?

A. We do not.

XQ. 252. Do you manufacture any substitutes for

the intermediates covered by the other patents which you have described this morning?

A. We do not, except insofar as I have stated in the manufacture of salicaine, which is not in any way related chemically to procaine.

THE COURT: Colonel Anderson, there has been so much of this testimony that I have overlooked, that I forget some of it, I am sorry to say.

Did you have in the testimony in your examination-in-chief any evidence that the patents of The Chemical Foundation were being used without the payment of royalties therefor or license fees therefor? I do not recall that. I was wondering whether you did.

MR. ANDERSON: There was evidence in chief from which I think that inference might be drawn. It is impossible for us to introduce direct evidence of that without going into the books of every manufacturer and investigating and bringing the evidence here—which I think we would not be allowed to do anyhow. I do not mean to say it would not be allowed by your Honor, I am not anticipating what your Honor would permit; but it would be an impossible task in any event, with 4800 patents, or 400 patents, for that matter, or 400 licenses. But I think there is evidence in the record from which that inference or argument may be drawn.

MR. KRESEL: Would you point out any of it, Colonel Anderson?

MR. ANDERSON: I will do that when I come to argue the case, Mr. Kresel.

MR. KRESEL: That is all right, if that is the Government's attitude.

MR. ANDERSON: Absolutely it is. I cannot undertake to argue the case in the midst of the

evidence, nor undertake to go over the evidence now and point out what its natural inferences are.

MR. KRESEL: That is all right, sir.

MR. ANDERSON: I have enough to do trying to get this evidence in.

MR. KRESEL: Are you through with the witness?

MR. ANDERSON: I am.

THE COURT: Just one more question, Mr. Kresel, before you begin the redirect. You still stand on your charge of conspiracy, I suppose?

MR. ANDERSON: Why, of course.

MR. KRESEL: What?

MR. ANDERSON: If your Honor please, we stand on every charge in that bill from the first to the last page, and if there is anything that I have said in this case, indicated in this case or suggested in this case that can narrow a single charge in that bill except by formal amendments, I wish to withdraw it before the evidence is closed and say it was not so intended.

THE COURT: Even to the effect that the assignments executed by Col. Miller were executed under a concealment of facts, a misstatement of facts?

MR. ANDERSON: On that question, if the evidence does not support it, when I come to examine it I shall not argue for its support, but I do not want to withdraw it in the midst of the trial.

THE COURT: It seemed to me, Colonel Anderson, that we might save much time. I am not criticising your position, but it seemed to me possibly much time might be saved if—you might misunderstand what I was going to say, so I won't say it.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 253. Doctor, I have just a few questions. Upon cross-examination you were asked about this substitute product for novocain and you were going to say it was not a new product, it was a well-known product, when you were stopped by counsel, and that much of your answer was stricken out. I would like you to state now first the name of the product, which I cannot repeat because I do not recall it, and then state whether it is a fact that that product was a well-known product to chemists and druggists, and for how long a time it had been on the market?

A. I will gladly state the fact. The chemical product itself is well known. It is chemically salicyl alcohol. Our trade name is salicaine. The pharmaceutical properties of the compound were discovered in this country, and that is public knowledge, by a university professor. That it was a local anesthetic was never known until his discovery.

RDQ. 254. And how long ago is that?

A. I cannot recall exactly. I think it was somewhere in 1920. Dr. Hirschfelder at the University of Minnesota, I think, or Wisconsin, perhaps; I am not certain.

RDQ. 255. Doctor, is it or is it not a well recognized fact in scientific literature, especially in chemical literature, with reference to patents taken out by Germans covering pharmaceuticals and dyes, that the specifications therein contained as a general rule are incomplete?

MR. ANDERSON: I have to object, if your Honor please.

THE COURT: I would like to have the question read.

(RDQ. 255 read as above recorded.)

MR. ANDERSON: I object, of course. We have gone as far afield as we can go, not producing every patent here. He cannot go into the matter of these patents issued to German people.

THE COURT: I will hear you, Mr. Kresel.

MR. KRESEL: I thought that Colonel Anderson himself a little while ago recognized the impossibility of going into the 4800 patents here, and I thought that perhaps he would be willing to let this witness, who certainly is eminently qualified to make the statement, make that general statement and to back it up by scientific literature where the statement is made to that effect.

THE COURT: Are you asking for a fact? Just how is the evidence called for? I recall the language of your question, but I am trying to get a legal classification for admitting this evidence.

MR. KRESEL: Yes, your Honor. I think if we were to classify that, I should think it bears upon reputation, which of course your Honor will realize was an important factor that would necessarily be in the minds of any proposed purchasers of these patents. In other words, if it were a well recognized fact in the industry, among scientific men, that the German in taking out their patents frequently if not always did not disclose the necessary information to make it possible for any person skilled in the art to actually perform the operation, that would be a fact that would naturally weigh with any purchaser and would affect the value of these patents.

THE COURT: I wonder if you will help me just a little bit at this point, Mr. Kresel.

MR. KRESEL: I will certainly endeavor to.

THE COURT: Because I am having difficulty with the know-how, or its absence. The word used by you in this question, as I recall it, is

whether or not the patents are not "incomplete."

MR. KRESEL: Perhaps that is an unfortunate use of a word, but I am glad to answer your Honor's question, however.

THE COURT: What word would you substitute?

MR. KRESEL: Let me see if I can reframe the question. I withdraw the preceding one.

RDQ. 256. Dr. Crossley, in the early part of 1919 was it or was it not a well-recognized fact among scientists and chemists especially, with reference to United States patents taken out by Germans covering processes for the manufacture of pharmaceuticals and dyes, that the practical knowledge of successfully performing the operations described in these patents was not as a rule disclosed in the patents?

MR. ANDERSON: I object, if your Honor please. If we are going into that issue, it may be that the Government will have to bring in here, pile and accumulate instances where German patents are used. If we are going to go behind the Patent Office's judgment and try it out in a collateral proceeding, whether a patent issued by the Patent Office is a proper kind of patent or discloses the information necessary to make a good patent, things of that sort, then we will do that. If we are going into the question of the understanding of the literature, we will have to ask leave to introduce authorities dealing with this subject and we will be here for a couple of weeks if we are going into that. We have tried everything else in this case now except character.

THE COURT: That has nothing to do with character, Colonel Anderson. If I understand it, the question is as to the reputation of the German patents. Do I understand you, Mr. Kresel, that that goes to validity?

MR. KRESEL: I was going to say, when your Honor stopped me a moment ago, that I do not want to be misunderstood. I repeat here that the defendant does not challenge the validity of the patents. I am simply trying to show that there was an absence of knowledge among American chemists at the time when these patents were disposed of, to enable them to make profitable use thereof and that there was no such practical information disclosed by the patents themselves as to make it possible for such untrained chemists as we had here—because they were untrained and I go quite the length with Colonel Anderson on that—for such chemists as we had here to make use of these patents.

Our claim is that the Germans with their knowledge and their experience were able to produce the products which they tried to cover by these patents, but that their knowledge and their experience was not available to us here; and if it was not, then the value of these patents to the American industry cannot be measured by the value of them to the Germans.

THE COURT: May I ask you one question there?

MR. KRESEL: Certainly, sir.

THE COURT: I was troubled yesterday by some of the questions asked and I turned to Walker on Patents, and I find this at Section 115:

"The detailed description of the invention must be full enough, and clear enough, and concise enough, and exact enough, to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make and use the invention, if it is a machine or a manufacture, or to compound the invention, if it is a composition of matter, or to perform the

invention, if it is a process, or to identify the invention, if it is a design. If the description falls below this standard, the patent, if granted, will be void. But this standard may be reached, in the case of a design, by a reference to the drawing or photograph annexed to the specification. In the statute by which this standard is established, the phrase 'any person skilled in the art or science' includes persons of ordinary and fair information and skill in the relevant art or science; and that phrase is not confined to the most eminent scientists, or to the most competent experts, in that science or art."

I have been trying to classify what you have meant and what the witnesses have meant by the word "know-how." Am I to understand by that phrase or term that you do not mean to infer or imply invalidity of the patent for want of a detailed description, but do you mean it to be understood that the art or science in this country to which most of these patents apply—we will call them chemical and dye and pharmaceutical patents—had not kept pace with the like art or science in Germany and that consequently, the disclosures in the patent, though sufficient probably to properly inform a person skilled in that modern art in Germany, were not sufficient to inform the chemists of this country?

Mr. Kresel: I think your Honor has summarized our position in that respect. With respect to the term "know-how", as to which your Honor says that you have some difficulty, I know of no one who could better answer the question as to that than the witness on the stand; and if your Honor will permit me, I should like to ask him to define what is meant in scientific terminology by "know-how" in relation to a patent. The

same question, I think, was asked upon cross-examination of Dr. Bolton yesterday.

MR. ANDERSON: It was brought out on direct.

MR. KRESEL: I think you asked him to define the term "know-how". However, if there is no objection, I should like to ask this witness the same question.

THE COURT: You withdraw the pending question for the time being?

MR. KRESEL: Yes, sir.

RDQ. 257. Dr. Crossley, will you be good enough to state what is meant by the term "know-how" as applied in relation to patents?

MR. ANDERSON: I object to that question and answer, sir, for the reason that it is an ordinary commercial term in use and does not require defining by chemists. If it has any such requirement, it has been defined by at least three of the witnesses for the defense on their own request and therefore, if it is intended to get a different definition from that already given, they cannot contradict their own witnesses. For these reasons, in addition to our general objection as to materiality, relevancy and competency, I object to going into that subject.

MR. KRESEL: I do not recall a single witness of whom I asked the question which I am now putting to this witness. It is true that our witnesses have stated that the know-how was not available, but I have never prior to this time asked any one to define the term. Upon cross-examination yesterday Dr. Bolton was asked to define it.

THE COURT: My recollection is that it was asked also by you; I think by both of you. That is my recollection. But what I would like to know is whether there is such a term in general use by scientific men, men dealing with patents, or

whether it is a term used commercially. I am not familiar with the term myself.

RDQ. 258. Dr. Crossley, I desire to paraphrase the Court's question and put it to you. Will you answer it?

MR. ANDERSON: The same objection, sir.

THE COURT: Objection overruled.

A. The know-how in my judgment, is the detail——

THE COURT: This question was as to whether there is such a term in use.

RDQ. 259. Is there such a term as "know-how" in use among scientific men with reference to patents as distinguished from the general use thereof in commercial life?

A. Yes.

RDQ. 260. In its relation to patents, will you state what is meant by that term?

MR. ANDERSON: Same objection as before.

THE COURT: Same ruling and exception.

A. It is the detailed and precise information necessary to obtain results. For example, a patent might state to add a certain ingredient to another and that the result would be a reaction of a certain type. That in itself is not sufficient to produce the result. It is necessary to know how that addition is to be made. For example, shall that addition be made on the surface or under the surface of the liquid? Shall it be distributed through the mass of the liquid or not and at what rate? Shall it be distributed through the surface? If it is a time-consuming reaction under a certain condition, what is that condition which determines the length of time that the reaction shall be carried out. All of those are absolute facts essential to the success of the reaction and are embodied in the term "know-how" and not provided in the patent.

By THE COURT:

Q. 261. Then that is a term that is in common usage among the scientists, particularly chemists, with respect to patents?

A. It is, sir.

By MR. KRESEL:

RDQ. 262. Dr. Crossley, when an inventor obtains a patent and then sells the patent, does he not give to the purchaser of that patent that very information that you have outlined?

MR. ANDERSON: I object.

THE COURT: I think that objection is well taken.

MR. KRESEL: I shall now repeat the other question, your Honor. May it be repeated?

THE COURT: Yes.

(RDQ. 256 repeated as recorded above.)

THE COURT: Do you not mean, under the direction of American chemists? I make that suggestion, because it seems to me that I am trying here the value of the patents in a sale, under the Trading with the Enemy Act, which is required to be to an American. What it seems to me would help me is whether or not the reputation among the chemists of America was that the disclosure of the German patents was or was not sufficient to enable them, without additional information, to perform the processes and make the products of the patent. That is the information, it seems to me, that will be helpful to me and not the broader question.

MR. KRESEL: I will reframe the question.

THE COURT: I am not suggesting that you reframe it. You can do as you like about that.

THE WITNESS: May I make a statement, your Honor?

THE COURT: No.

By Mr. Kresel:

RDQ. 263. Dr. Crossley, in the months of February, March and April, 1919, was it or was it not a well-known scientific fact among American scientists and chemists that in the German patents taken out in the United States by Germans, covering the manufacture of pharmaceuticals and dyes, that there was not sufficient information disclosed to American chemists at that time for the successful production of the products covered by those patents?

Mr. Anderson: I object for the reasons stated and for the further reason that it does not appear that this witness is competent to give an opinion on that.

The Court: Is there objection to the question?

Mr. Anderson: Oh yes, sir. I beg your Honor's pardon. I object to the question for the reasons stated and for the further reason that it does not appear that this witness is competent, if anybody is competent, to answer a question of that kind and of that scope. And I shall make the objection for the further reason that obviously, it is not on re-direct examination.

The Court: That objection is well taken, so far as I am now advised.

Mr. Anderson: The other grounds of objection which I have ventured to outline to your Honor, I will not repeat. I think it is a question outside of the scope of the trial of this cause and it does not appear that it entered into the consideration of these things at all at the time the sale took place. Whatever may be the opinion of this gentleman as to German patents, it does appear by affirmative evidence introduced in the report of Mr. Palmer that there were some 25,000 German patents, the greater part of them in use in

the United States at that time. Therefore, it seems to me, with all deference to your Honor and counsel, that the question is an improper one. I therefore wish to object and to state my position on the record.

THE COURT: What is the testimony, according to your recollection of Mr. Palmer, that there were 25,000?

MR. ANDERSON: I think Mr. Palmer's report states, and that appears in a number of places in this record, that there were something like 25,000 patents in use, German patents, at that time. It appears in this record that 5700 of them were licensed and under royalties to the United States, that in addition to that 4800 of them were assigned to The Chemical Foundation; that a number of them were then being used by people in the United States in the production of well-known drugs and chemicals and dyes. All of these facts are of record.

THE COURT: I think those facts enter into the value, also, Colonel Anderson; but you do not contend, as I understand you, that all those 4919 patents taken over by The Chemical Foundation had been used, do you?

MR. ANDERSON: No, sir, that is not the suggestion.

THE COURT: I do not know anything about it yet, whether the German patents had acquired a reputation among the persons skilled in the various arts, particularly in chemical science, as being incomplete in detail as to prevent the American scientific men from readily making application or use of the patents. Now, it seems to me that if there was such a reputation or belief generally among the persons engaged in the chemical arts and sciences, that that would be an element

which would be proper for me to take into consideration in determining whether the price paid for these patents was adequate or inadequate, would it not?

Mr. Anderson: May I suggest to your Honor that a patent is either a patent or it is not a patent, and the claim is made that there is no attack upon the validity of these patents, and therefore they are valid, and they must, under the law, disclose the essential facts for one skilled in the art to use the process. Therefore, I will differ to some extent with the suggestion contained in your question, to say that I do not think it is a proper question to be considered in this case, and I think it is so utterly indefinite that it would have no possible bearing upon the value of this property. If these were patents, they were patents, and some of them were being used at the time, and therefore I do not think that a consideration of this kind can have the slightest weight on their value, what the general reputation was concerning the Germans in getting out patents, so if we are going to fix a value on that basis, it is, of course, a question of the number of the witnesses one side or the other side will bring as to their reputation.

The Court: Is not that true of the nature of every issue tried on the civil side—that it depends upon the number of witnesses and their credibility and other things? Is not that the only way that justice is being administered on the civil side in America?

Mr. Anderson: I should think that was true when they testify to material facts; but if I were going to sell a house or a piece of property or a piece of land, I do not think the value of the land

would be affected by whether I had a good reputation or a bad reputation.

THE COURT: Neither do I; but you are dealing here with German chemical patents—they were German patents, as it is now held. In cross-examination of Dr. Bolton yesterday, Colonel Anderson, you asked him this, as I recall it—whether it did not take the Germans themselves five years of experiments to develop on a commercial scale the products or processes for manufacturing the products which were covered by their patents which were manufactured on a laboratory scale?

MR. ANDERSON: Yes, sir.

THE COURT: Now then, the inference that I have drawn or thought proper to be drawn from the testimony, I do not know whether it is warranted or not, even if there has been no direct evidence pertaining to it, which has been that the Germans had developed the chemical arts and sciences more fully and completely than had the United States or the people in the United States, and were in advance of the people in similar arts in America. Is there, or is there not, evidence to support that; and is that a proper or improper inference to be drawn from the evidence in this case?

MR. ANDERSON: I think probably that would be a question of the point of view, but I think probably the inference might be drawn from this case that in the specialization in certain branches of industrial chemistry, the Germans had carried it very much farther than any others, on the same scale. There were men no doubt in the United States that had the capacity and even, I may say, possibly the experience, though I do not know, to have equalled any German chemists in the produc-

tion of those particular chemicals or dyes; but the number of people, the personnel trained in actual practical industrial experience was very limited. I think that that involves the experience of the person chemically in the application of the chemical knowledge; the experience in the construction of machinery; the engineering problems of economy and efficiency in the administration of that particularly highly technical and specialized business.

Now, it is, of course, obvious to every one, and nobody has ever suggested anything to the contrary, that at the time of the war, the beginning at least, of the development of American industry in industrial life along those particular lines had been greatly retarded, we may say, or had not been pressed, the other problems in the great development of this continent interesting them more at that time. Their ability was probably equal but it was merely the application of that ability. Now, if we come to the time that those patents were sold, there were in fact 90 per cent of the dyes or a large part of them produced in the United States, according to Mr. Palmer's report. The development had gone very far. How far those people had been trained in that work is a question. Now, I doubt if they could have reached perhaps the state of actual practical, what I may call applied, knowledge. That takes a long time in any branch or profession to acquire. When I say "applied" I mean not only chemical, but mechanical knowledge necessary to the achievement of these results. That is my own personal impression of the situation as best I can state it to the Court.

THE COURT: You have helped me quite a lot, Colonel Anderson, and I appreciate it, but I think

you have not gotten all the matters of value out of this question, and I think probably counsel can help me a little further. I take it that your statement that the Germans had developed certain of the specialities in chemistry more than the Americans applies particularly to the nitrogen fixation processes, the dye industry, and pharmaceuticals. Do I misunderstand you with respect to that?

MR. ANDERSON: As to pharmaceuticals I have no very defined impression. As to the industrial, or what might be called the manufacturing, and that in its broad sense, the development of certain of these very modern methods of the synthetic production of matters here like the nitrates and ammonia, and perhaps some of the dyes, undoubtedly I think that the evidence would tend to lead one to the conclusion, although I have not made a study of it, that the Germans had developed their processes industrially to an extent not achieved in America. I think that is quite a natural inference to be drawn from the industrial processes.

THE COURT: Then would not this be an inevitable corrollary of that fact, that before the patents were taken out by the Germans in America, which we will assume were plainly intelligent and clear to the German chemists who had followed the developments of the chemical art in Germany, while they might be worked out by the American chemists in the application of their product, yet, inevitably, the American chemists would have to follow the precise pathway that the Germans did in that development, and it would require, consequently, both money and time in such development; would not that be the inevitable corollary?

MR. ANDERSON: It might be and it might not be, sir; but it would be a most remote factor in

dealing with the question of value. In my judgment it would not have the slightest effect upon the price which a seller of this property ought to obtain. That depends upon the particular case, whether it would or would not be.

THE COURT: Let me put this question, Colonel Anderson. Here is a patent to be produced by the use commercially of what may be called product X. You know full well that the Germans had developed that and are making it on a commercial scale, and it was to be put up for sale here in America, at public bid or public sale. Is it your thought that that patent would bring the same amount at such public sale as if that art had been fully developed in America?

MR. ANDERSON: It would depend upon various circumstances. If your Honor will permit me, you have not stated all the circumstances that occur to me in the hypothetical question there which I would like to answer.

THE COURT: I will get you to answer mine, and you can then state yours, if you will; but would not that fact be a material fact in determining what would be received for the patents at a sale?

MR. ANDERSON: It might or might not, depending upon the particular circumstances. For instance, if it were a product patent and if the product was of great value in America, and the product patent gave you a right to charge for importation, or to produce, as you might see fit, then I would think that the facts that you have indicated would be of very material consequence. You could import it as long as you needed it, and your patent would give you the control of the importation in the entire American market, and then if you wanted to manufacture and found that

more desirable, you could do it; I am speaking from the standpoint of the purchaser now, not of the public interest—you could do it, or you could do both, and derive the revenue which the American market would possibly afford under that patent, and therefore the value of the patent would not be affected in the slightest by that difficulty in my judgment. In the second place, the question which was raised here, is a question of——

THE COURT: Let us leave that just for a moment, Colonel Anderson. Then, if I understand you, if you were a bidder at that public sale, and realized that you would have to pay $50,000 to be able to put the process of the patent on a workable basis, you would be willing to bid and pay just as much for it as if you knew that you could put it on a commercial basis without the expenditure of $50,000?

MR. ANDERSON: I do not think it would affect the amount I would pay in the slightest, if you gave me the control of the American market of that product, and I could import it, I would make it on import duties while I was building my factory. I can take that thing and make more money out of it in that way than by manufacturing, and I could make the importer pay the price.

THE COURT: By reason of monopoly?

MR. ANDERSON: Yes.

THE COURT: And the barrier of the port?

MR. ANDERSON: Yes.

THE COURT: I think the answer to the question asked may be slightly helpful; I am not sure that it will or will not. I have some doubts about it, so I will let you take the answer.

MR. ANDERSON: Your Honor will reserve me an exception.

THE WITNESS: Read the question.

(Question repeated as recorded.)

A. It was.

RDQ. 264. Has there been in the scientific literature any discussion of that fact?

MR. ANDERSON: I object, sir.

THE COURT: You may take the answer.

A. There has been. There was——

MR. ANDERSON: The question is answered, I think.

RDQ. 265. Will you state in what literature there is found the discussion of that fact?

MR. ANDERSON: I object, sir.

THE COURT: I will assume that your objection is taken to each of the questions on this line, and the objection will be overruled and the exception noted.

Now, Mr. Kresel, you are going back to a period prior to April 10, 1919?

MR. KRESEL: That was my question, your Honor.

RDQ. 265. (Continued.) You understand, Doctor?

A. Yes. Here is an editorial from the Journal of Industrial and Engineering Chemistry, March, 1918, dealing with that subject.

RDQ. 266. Is that a well-recognized publication and one which circulates among chemists in America, and did at that time?

A. That is a recognized journal for the publication of information in industrial chemistry in this country.

RDQ. 267. And was at that time?

A. And was at that time.

THE COURT: We will take our noon recess at 11.30, and no intermediate recess this morning.

MR. KRESEL: I just want to read this editorial into the record. There is no use of putting it in as an exhibit. (Hands paper to Colonel Anderson.)

MR. ANDERSON: Of course, that is subject to objection. We object to the introduction of this editorial.

THE COURT: You may read it of record.

MR. KRESEL: Editorial from the Journal of Industrial and Engineering Chemistry, March, 1918. The article is headed, "A Patent Abuse." (Reading):

"The exigencies of the war period have led to feverish activities in many laboratories in attempts to carry out processes described in the literature and in patent specifications, chiefly in the field of organic chemistry. Within the past year we have frequently been apprised by chemists of the lack of success in the preparation of compounds by following directions, even by most careful attention to the minutest details, in the official records. Men who have experienced this difficulty stand so high that no question of lack of skill and technique can be involved, and we are forced to the conclusion that deliberate misrepresentation has been made, especially in the case of certain foreign patents. If this is true, it is extremely regrettable that the literature of chemistry is clogged with such deceit; in the case of patent specifications, it is reprehensible, in that a matter of perjury is involved. The demonstration of such falsity would immediately invalidate the patent, but this is a tedious process, necessitating a great amount of laboratory work and expense and loss of time in litigation."

That is all of it that I desire to read.

THE COURT: That will be admitted only as indicating the reputation and not as evidence of the truthfulness of the facts therein contained.

RDQ. 268. Have you another, and what is it from?

A. I have another. It is from the book on "Coal

Tar Dyes and Intermediates," by E. De Barry Barnett.

RDQ. 269. What is E. De Barry Barnett's profession?

A. He is an industrial chemist; also a professor of industrial chemistry.

RDQ. 270. Is he a man well recognized in your profession?

A. One of the authorities in England today.

MR. KRESEL: I read from this publication, which is a book entitled "Coal Tar Dyes and Intermediates," by E. DeBarry Barnett, B. Sc., Lond., A. I. C., Consulting Chemist to Bagley Mills & Co., Ltd., formerly Research Chemist to Levinstein, Ltd., and Works Manager to the Stockton-on-Tees Chemical Works, Ltd., published in New York by D. Van Nostrand Company, 25 Park Place, in 1919.

MR. ANDERSON: I wish to add to the grounds of objection that it is not competent to read from a published book in evidence, but only to call the witness who published the book and let him testify.

MR. KRESEL: That is a new doctrine I never heard of.

MR. ANDERSON: I have been ruled out of court on that a good many times, so I think that is the law on that.

THE COURT: There is no doubt that under certain circumstances it is, but not under these circumstances. You may proceed.

MR. KRESEL: "The number of patents taken out by the German firms for the manufacture of intermediate products and dyestuffs is very large, and in spite of the optimistic claims made in the specifications, only a few of them are workable as commercial propositions. It has long been the custom of these firms, when taking up a subject,

to put down a barrage of patents in order to block access and at the same time to act as a kind of camouflage and disguise the processes actually in use. For the same reason the specifications are usually carefully drawn up so as to give as little information as is compatible with validity, and much skill is exhibited in this direction. Consequently the reader who finds a patent describing a patent in detail should not conclude that he has all the information necessary in order to manufacture. No doubt the description given will enable him to make the compound in question, but whether it will enable him to do so at a profit is quite another question."

Which goes to bear out what our people have said.

MR. KNIGHT: I offer the objection, if your Honor please, to make it appear that this was known before the date of purchase of these patents.

THE COURT: What is the date of that?

MR. KRESEL: In 1919.

THE COURT: What date in 1919?

RDQ. 271. Can you state?

A. I cannot state exactly. I think it was the early part of 1919.

MR. KRESEL: There is nothing on this photostat, your Honor, from which I can state the exact date in 1919.

THE COURT: You may make inquiry, and if it appears to have been circulated after April 10th, you may call my attention to that fact and move to strike it out.

RDQ. 272. Have you any other?

A. No.

THE COURT: I will ask you, Mr. Kresel, to inform me, if you will, as to what you find out about it.

MR. KRESEL: I will, your Honor. We will find out the exact date of publication. In this same connection, if your Honor will permit me, I would like to read the translation of a portion of Defendant's Exhibit No. 238, which your Honor will recall was the official report to the Chamber of Deputies in France with reference to the contract that was made with the Badische Company.

MR. ANDERSON: If your Honor please, I object to reading from exhibits in evidence. It is in evidence and we are not now arguing this case.

THE COURT: I wish you had made that objection before, because you and Mr. Galloway read them.

MR. ANDERSON: We have a right to read the exhibits into evidence, but when we introduce the exhibits we do not put them on the record, and I object to copying that matter on the record.

MR. KRESEL: Then never mind.

THE COURT: It is not going to be copied on the record.

MR. KRESEL: May I say in this connection, as long as the subject has come up, that our translation that we put in of this document, I find, is a translation of only a portion of it, and I desire the privilege of producing, before we close the case here, a translation of the balance of it.

THE COURT: You may. Of course, first submit it to Colonel Anderson.

MR. KRESEL: First submitting it to the other side, certainly. There is only one paragraph I desire to read.

THE COURT: Before you do that, will you tell me this, Mr. Kresel—as to whether that document was in circulation in this country prior to the sale of these patents?

MR. KRESEL: No, your Honor; this was not.

THE COURT: Then it would not have anything to do with the sales price, would it?

MR. KRESEL: I am not prepared to say that, your Honor.

THE COURT: Whatever the patents may be worth in fact, if they had a bad reputation at the time of sale, that might have reduced the value.

MR. KRESEL: This does not pertain to reputation; so I do not think it comes in in this connection. I will not insist upon it.

MR. ANDERSON: May I inquire if the last paper put in, the book of publication, was limited to the subject your Honor stated?

MR. KRESEL: I have not put the book in.

MR. ANDERSON: I mean the extract from the book.

MR. KRESEL: Whether it is limited to what?

MR. ANDERSON: To the purpose of showing reputation, but not proof of facts.

MR. KRESEL: I understood your Honor's ruling to be that.

MR. ANDERSON: My observation is when a thing is in evidence, it is in evidence. But at the same time, if we are going to limit it, I would like to limit it to the purpose of this particular thing and have the record show that.

THE COURT: I think it does already, Colonel Anderson. If not, the same observation that was made as to the editorial applies to the book.

MR. KRESEL: That is all, Dr. Crossley. Have you any further questions, Colonel Anderson?

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 273. Dr. Crossley, do you know who wrote the editorial in question, of your own knowledge?

A. I do not.

RXQ. 274. Do you know whether Dr. Barnett has ever applied for or taken out patents in the United States on chemicals, dyestuffs or intermediates?

A. I do not recall at present.

RXQ. 275. You do not know?

A. I do not.

RXQ. 276. Do you know whether at the time that he wrote this book he had applications pending for patents before the Patent Office on dyestuffs, intermediates and pharmaceuticals?

A. I do not.

RXQ. 276-a. And you do not know on what date that book was published?

A. Exactly? No.

MR. KRESEL: That is all, Doctor.

(Witness excused.)

THE COURT: How many more witnesses have you, Mr. Kresel?

MR. KRESEL: This one now coming, and one more, sir. I shall certainly get through today, and I hope to get through rather early today.

JAMES BAYARD ELIASON.

JAMES BAYARD ELIASON, a witness called on behalf of the defendant, being duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Where do you live, Mr. Eliason?

A. Wilmington, Delaware.

Q. 2. What is your occupation?

A. I am comptroller of E. I. duPont de Nemours Company.

Q. 3. What are your duties as comptroller?

A. The general supervision of the accounts of the company.

Q. 4. How long have you been in that position?

A. Since April 1, 1921.

Q. 5. Prior to that what was your position?

A. I was assistant comptroller.

Q. 6. And what were your duties as assistant comptroller?

A. Practically the same, subject to the comptroller's direction.

Q. 7. For how long a period had you occupied the position of assistant comptroller?

A. About three years.

Q. 8. Have you prepared and can you produce now a statement from the books and records of the duPont Company showing the amount that that company has spent in research and experimentation leading to the manufacture of dyestuffs?

A. I can, up until June 30, 1921.

Q. 9. Are the figures subsequent to that date available?

A. I do not have them at the present time.

Q. 10. You have not them at this time?

A. No.

Q. 11. Will you produce the statement up to June 30, 1921, then, and let me have two copies. I want to show one to Colonel Anderson.

A. (Witness hands counsel papers.)

MR. KRESEL: Colonel Anderson, I want to offer this statement, and then, of course, you may cross-examine the witness as far as you want to go (hands counsel paper). I want to do it because it will shorten the examination.

Q. 12. Is this a correct statement, Mr. Eliason?

A. I believe it so to be.

Q. 13. Taken from your books and records?

A. Yes.

MR. KRESEL: I offer it in evidence.

THE COURT: Do you want to cross-examine before it is marked, Colonel Anderson?

MR. ANDERSON: No, sir; I think I will let it go in and reserve the right to cross-examine. Of course, it is not a detailed statement, but I suppose I can bring that out on cross-examination just as well.

Received in evidence and marked "Defendant's Exhibit No. 286." (*See Exhibits, Vol. V, page 3246.*)

MR. KRESEL: I shall simply give your Honor the total. This shows that the expense incurred for chemical research upon dyes and dye intermediates by the duPont Company to June 30, 1921, was $3,865,559.02. You may examine.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 14. What elements of expense are included in the statement which has just been filed, Mr. Eliason?

A. Salaries paid to chemists, materials used in chemical research work, repairs to equipment, telephone expense, and miscellaneous items such as would be incurred in work of that character.

XQ. 15. Have you included any overhead?

A. There is no overhead in these figures of the central chemical office in Wilmington. They do include the management and superintendence, salary and expense, at the laboratories themselves, where the experiments were conducted.

XQ. 16. How many products does the duPont Company make, of dyes, intermediates and chemical products?

A. I do not know.

XQ. 17. What proportion of those products is

made under licenses of the Federal Trade Commission and The Chemical Foundation?

A. I do not know.

MR. KRESEL: All that, your Honor, has been asked of Dr. Bolton. I beg your Honor's pardon.

MR. ANDERSON: On the contrary, I tried to get the information yesterday and could not.

MR. KRESEL: Well, I will not argue it.

XQ. 18. Do your records show what proportion is made under these particular licenses?

A. The records of the accounting department do not show that information.

XQ. 19. They will not show it?

A. No.

XQ. 20. Where are the records that would show that?

A. I do not know.

XQ. 21. What proportion of the overhead of your chemical laboratory, which you say is included here, is charged against the products under licenses of The Chemical Foundation or the Federal Trade Commission?

A. I do not know that.

THE COURT: Colonel Anderson, if it will help you, I was going to ask Mr. Kresel to produce that for you in some way, and you may reserve the cross-examination of this witness until after that is done, if you wish.

MR. ANDERSON: It is perfectly obvious, your Honor, that I have got to move to strike this statement out unless that is produced.

THE COURT: I should not have interrupted you if I did not think your ground was a good one.

MR. KRESEL: May I understand just what Colonel Anderson wants?

THE COURT: Yes.

MR. ANDERSON: I mean now that I will make a motion at this time to strike this statement out entirely, because it means nothing, it has no evidential value of any kind. I shall make a motion to strike that out at this time. I do not ask your Honor for a ruling on it now if your Honor will rule on it afterward. I do not want to be arbitrary about the matter in any sense; but of course, if we are going to prove the cost of experimentation, it must be experimentation on the particular patents in issue.

THE COURT: What I have in mind, Mr. Kresel is this: Colonel Anderson is entitled to be able to say that this item, takin[illegible]hat, should not have been included, that there is too much overhead for these experiments under these patents. All the overhead, for instance—I will assume a fact which probably does not exist, but which so far as I officially know may or may not exist—of a particular plant, where nine of the matters under investigation were covered by the license from The Chemical Foundation and ten others were under investigation at the same time, overhead was charged to the nine, for instance. I am not assuming that as a fact, but Colonel Anderson is justified in assuming anything until it has been shown by you.

MR. ANDERSON: Yes.

MR. KRESEL: But, your Honor, the mere fact that the expense was incurred in experimenting with a process which, though covered by a patent owned by The Chemical Foundation, was not in fact thereafter used and no license thereon was taken, would not necessarily deprive us of the benefit of the information that in the development of those processes that cost was incurred.

THE COURT: But you see we do not know as the record now stands just what the facts are.

MR. KRESEL: Because I want to get clear just what your Honor says Colonel Anderson is to have. Assuming, for the purposes of the argument, that all investigation in which this entire cost was incurred was investigation of processes covered by these patents owned by The Chemical Foundation, then there is no necessity of subdividing it, there is no way of subdividing it.

THE COURT: Oh, no, that would depend upon circumstances. But what Colonel Anderson, I think, should have—his views may be different from mine— is the detail facts. How you get them I do not know, but he is entitled to them, as I view it.

MR. ANDERSON: And I would search those very carefully, sir.

THE COURT: I beg your pardon?

MR. ANDERSON: I would want to search those very carefully, and the information brought into court, to show exactly what the expenditures were in connection with the processes covered by each of these licenses.

THE COURT: You may confer with Mr. Kresel.

MR. KRESEL: Every carfare I suppose you want.

MR. ANDERSON: I would want the detail.

MR. KRESEL: And every penpoint that is bought?

MR. ANDERSON: I want the details.

MR. KRESEL: Yes.

MR. ANDERSON: And I want to know what the cost is.

MR. KRESEL: We will supply as much as the Court says you shall have.

MR. ANDESON: I have had too much experience with corporations and their accounting systems.

MR. KRESEL: We do not run corporations the way you ran yours, perhaps.

MR. ANDERSON: Possibly not. I do not think you did.

MR. KRESEL: Your Honor said we would take the recess at half-past twelve. I can put on another witness, or your Honor may take the recess now.

THE COURT: We will take the recess now.

AFTER RECESS.

MR. KRESEL: My understanding was, your Honor, that the witness was not to be cross-examined any further until the information had been supplied.

THE COURT: At the pleasure of Colonel Anderson.

MR. KRESEL: Is that your desire, Colonel?

MR. ANDERSON: It seems to me it would be better not to start twice on the same thing. We would probably get right up against another obstacle.

THIRTY-SECOND DAY.

Wilmington, Delaware,
July 20, 1923, at 8.30 o'Clock A. M.,
Standard Time.

Before:
HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. KRESEL: If your Honor please, pursuant to Colonel Anderson's request the witness, Eliason, who was on the witness stand yesterday, has prepared two statements showing the amounts spent by the duPont Company in research work and experimentation on products for which it subsequently took out licenses both from The Chemical Foundation and from the Federal Trade Commission. We have the two statements separately, the one for the Federal Trade Commission separated from that of The Chemical Foundation. Colonel Anderson now desires that we cut this up by years, and Mr. Eliason is going to undertake to do that. My understanding with Colonel Anderson is that when that is prepared, even though it be subsequent to the closing of the taking of evidence, the Government may, if it desires, put that in.

JAMES BAYARD ELIASON, recalled as a witness on behalf of the defendant, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 22. Mr. Eliason, have you prepared a statement showing the expenditures made for research work by the duPont Company on products subsequently licensed from the Federal Trade Commission for the period covering 1916 to January 1, 1923, arranged by licenses or license numbers taken from the Federal Trade Commission?

A. I have.

Q. 23. Is this the statement?

A. Yes, that is the statement.

Q. 24. From what was it prepared?

A. From the records of the duPont Company.

Q. 25. And is it correct?

A. It is.

Q. 26. Have you also prepared a statement of research expenditures on products licensed from The Chemical Foundation covering the period from 1916 to January 1, 1923, likewise arranged under license numbers?

A. I have.

Q. 27. And is this the second statement?

A. That is the statement.

Q. 28. And from what did you prepare that one?

A. From the records of the duPont Company.

Q. 29. And is it correct?

A. It is.

MR. KRESEL: I now offer in evidence the Federal Trade Commission statement, which will be No. 316.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 316." (*See Exhibits, Vol. V, page 3413.*)

MR. KRESEL: And the one relating to licenses from The Chemical Foundation.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 317." (*See Exhibits, Vol. V, page 3414.*)

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 30. Mr. Eliason, could you state just how you kept your books to show the data under each license? You can do that in answer to that general question.

A. Our books were kept according to subjects under which experimental and research work was conducted at our several laboratories, and those subjects were all numbered as listed on the statement which I have just shown.

MR. KRESEL: Just give an example to illustrate.

THE WITNESS: Under license No. 327, issued by The Chemical Foundation, the subject of anthracene. The first item there is J 15-33-3, anthracene being the name of the account. All expenditures made in the laboratory were charged to that account and reported by the laboratory to the accounting department. In the accounting department we collected the charges under that heading.

XQ. 31. During the period of experimentation or research was any of the material covered by a particular account produced?

A. I cannot state that of my own knowledge, Colonel.

XQ. 32. Do you know whether in such event the material so produced was sold in the market during the period of research?

A. Throughout the accounts there are credits indicating that material which was produced was cred-

ited at a value to the account to which the expenditure was charged.

THE COURT: Does that credit show on these statements?

MR. KRESEL: Will you answer the question the Court asks?

XQ. 33. The Court asked if those credits showed on these statements in detail?

A. Those credits do not show on these statements in detail.

THE COURT: But do show in the aggregate?

THE WITNESS: The figure shown is net.

XQ. 34. The figure shown is net?

A. Yes.

MR. KRESEL: After deducting the credit?

THE WITNESS: That is correct.

THE COURT: That is what I wanted to bring out.

XQ. 35. Can you tell me what you did charge to research?

MR. KRESEL: Do you mean the nature of the item?

MR. ANDERSON: Yes.

A. Salaries paid to the chemists, material used in the research work, sundry expenses in connection with it, such as small equipment used in the laboratory, glassware and chemical-ware, any telephone charges or items of general expense.

XQ. 36. Taking salaries, if a chemist was working on a particular experiment or development of a particular process in the laboratory, how did you know what proportion of his time was devoted to that process and what proportion to other processes?

A. Each month a salary distribution was furnished by the management of the laboratory showing the proportion of each chemist's time chargeable to

the different jobs on which he had worked during the month.

XQ. 37. And your books from which this statement is made were made up from those reports?

A. That is correct.

XQ. 38. You, of course, do not know yourself anything about those reports?

A. No, I could not testify to the accuracy of the original distribution.

XQ. 39. As to material, can you state how the material was charged to each of these particular items?

A. Yes, material purchased specifically for use in connection with a definite experiment was charged when purchased to the account in which the cost of that experiment was kept. If material was used from stock at the laboratory, such as stationery or small items, that was charged by monthly distribution, records being kept by the storekeeper who issued the material for the job.

XQ. 40. And the storekeeper kept his records and charged the supplies so sent out against these particular items?

A. Yes.

XQ. 41. You spoke of miscellaneous expenses, telephone and general expenses. That was necessarily an approximation, was it not, or an arbitrary distribution as between these various items?

A. An item of telephone expense would be considered as a general expense of the laboratory and pro-rated at the end of the month over all jobs to which it applied, unless it was something definite.

XQ. 42. Let us take the manager of the laboratory and general officers whose time was not devoted to any particular thing. How did you apportion that among these various items?

A. That was pro-rated on the basis of the direct

salaries charged to the different jobs during the month.

XQ. 43. That was pro-rated on the basis of the respective direct charges; that is how you pro-rated the general charges?

A. That is correct.

XQ. 43a. Can you say what proportion of the charges were general charges and what proportion direct charges or specific?

A. I do not have the information at the present time.

XQ. 44. Could you approximate it?

MR. KRESEL: You mean the percentage or the amount, Colonel?

A. I could not.

XQ. 45. I mean the percentage. I am not asking you for the figures. I know you could not carry those in your head; but let us take, for instance, here is license No. 327.

THE COURT: Can he supply that, Colonel Anderson, on his further statement, or do you want to use it now as a basis for cross-examination?

MR. ANDERSON: I only want to make the point clear and then it might be I might ask for it, sir, if he can give it now approximately.

XQ. 46. You take license 327. There were ten patents or subjects or products under that license. Now, they have each of them from eight to ten items of different charge under them; that is a different kind of stuff made in connection with that particular product apparently. Now, how could you apportion your general expenses so as to carry them into these various items of research which you have laid out here?

A. The general expenses, as I stated, were distributed to these several accounts, pro-rated on the basis that the salaries of the chemists working on each of the accounts were distributed from the records.

XQ. 47. Could you, in making up the additional data which I am going to request you to give, give me a statement of the proportion of these charges represented by general expense, and the proportion represented by direct charges, and I will say that if it would require a great deal of labor, I would not ask you to make it absolutely accurate; I mean I won't ask you to give any detail, and divide these items into direct and general charges, but if you will state in dividing this statement up into years at the bottom, approximately or as accurately as you can get, the percentage of that charge was so much of general expenses, and the percentage of direct charges to the particular work was so much, I will greatly appreciate it.

A. I will endeavor to do that.

XQ. 48. Now, can you give me the distribution of these charges by years; that is, for the year 1916, and then each successive year up to the date of January 1, 1923, showing the total as the result?

A. That can be taken from the records, yes.

XQ. 49. I would ask you to prepare a statement showing that distribution by years, and at the bottom of each of these headings like anthracene and anthraquinone, just add a figure "percentage of general expense; percentage of direct charge"; and I say if that would involve a great deal of detailed labor, if you can approximate it, so that you can say on the stand that it is accurate, that is all I will ask—reasonably accurate.

XQ. 50. Do you know whether these accounts were kept on this same basis from 1916 down to the present time, or have you had any changes in the methods of accounting?

A. They were kept on the same basis, I believe, from 1916 down until the present time, with this exception, that since January 1, 1923——

XQ. 51. I am not interested in that period. You

only bring it down to 1923. If the accounts were kept in the same manner throughout the period of this statement, that is all I want?

A. Yes.

XQ. 52. I see you have put in here Federal Trade Commission license No. 19 and license No. 18-A. Are those the only two licenses that the duPont Company had from the Federal Trade Commission, do you know?

A. I understand that there were other licenses from the Federal Trade Commission that were subsequently re-issued by The Chemical Foundation.

XQ. 53. This statement then that you have filed under the heading of expenditures for research on products licensed from the Federal Trade Commission covers the expenditures made under those two licenses during the time that they were in effect and before they were exchanged into licenses from The Chemical Foundation?

A. Those two licenses, I understand, were not subsequently taken over from The Chemical Foundation.

XQ. 54. But where they were subsequently taken over or changed into licenses of The Chemical Foundation, you have included the entire expenditure during the Federal Trade Commission period and The Chemical Foundation period in the one statement; is that true?

A. That is right.

XQ. 55. Then I will ask you, in making up the new statement, if you can from your records, without too much difficulty, do so, to make it complete, indicate under each license when the period under the Federal Trade Commission license terminated and when the other license was taken out; would you do that?

A. I will endeavor to do that if I can get that information.

XQ. 56. I know your records would show it, and

it would make it easier to study this statement. Of course, we could dig it out of the records. You have then the three points I want to cover with the statement: The distribution of these items by years, under each item the proportion of general to direct expense, and then to indicate the period of the change of license from the Federal Trade Commission to The Chemical Foundation?

A. Yes.

XQ. 57. You spoke of equipment, etc. Can you be a little more specific as to the equipment which you charged to experiment or research work as distinguished from general laboratory work?

A. I understand that the only equipment charged to general research work is the actual equipment used and consumed in that particular research account.

XQ. 58. Do you know whether the equipment of the laboratory which happens to be used in that research work when purchased is charged to research?

A. Will you repeat that question, please.

XQ. 59. Do you know whether the equipment actually used in the particular research covered by these statements which is the general equipment of the laboratory, is charged to research, this particular research account, or any part thereof?

A. I think it is not.

XQ. 60. You think it is not. Are you sure of that?

A. That is the best of my knowledge.

XQ. 61. To the best of your knowledge and belief?

A. Yes.

XQ. 62. I take it, Mr. Eliason, that your duty in the general office is as chief accountant?

A. Yes.

XQ. 63. Where is the laboratory in which these items are charged up?

A. The laboratories are located at Deep Water Point, New Jersey.

XQ. 64. That is, over across the river?

A. That is the big laboratory, in which the dye experiments are conducted. There is also a laboratory of the company above Wilmington, on the Brandywine, where research work is conducted.

XQ. 65. The particular research work that is covered by these statements is done at Deep Water, is it?

A. Entirely so, with one or two small exceptions, which are noted in these statements with the title "R" and "J" in front of the account number.

XQ. 66. Then these symbols on these statements, J-31-11-B, for instance, indicates the work has been done at the Deep Water laboratory?

A. Yes, known as the Jackson laboratory.

XQ. 67. That is where your plant is located?

A. Yes, sir.

XQ. 68. And the "R", for instance, "R-128-B", indicates that the research work charged up was done in the laboratory on the Brandywine in Delaware?

A. Yes.

By The Court:

Q. 69. What do you call that laboratory?

A. We call it the experimental station.

Q. 70. What does the "R" indicate?

A. It is merely a symbol.

The Court: There was one thing known as the Jackson and I was curious to see what the other one was.

Mr. Anderson: "R-128-B" was the symbol.

By Mr. Anderson:

XQ. 71. The actual operation of the laboratory and the details of administration and charges in the laboratory I take it, you are not familiar with?

A. No.

XQ. 72. Your accounts are made up from the reports sent in to the general accounting office from the laboratory?

A. That is correct.

XQ. 73. I notice here that you have under Federal Trade Commission license No. 19 a charge to indigo and derivatives—plant process. What do you mean by plant process, Mr. Eliason?

A. I cannot answer that question. I do not know.

MR. KRESEL: If you want to know that Dr. Bolton is here, who can answer.

MR. ANDERSON: I may desire to ask that question.

XQ. 74. The same as to indigo and derivatives—synthetic, I assume? Well, I need not ask you that, because you probably could not answer it when you cannot answer the other. Then, under license No. 18-A, you have under the manufacture of sodium hydrosulphite four items. I suppose your answer would be the same as to that, that you are not in a position to answer it, and you only take the designation as sent in from the laboratory?

A. Yes.

MR. ANDERSON: If you could possibly make up the statements which I requested by tomorrow without undue hardship, I would like very much to have it tomorrow if possible. I might want to ask some other questions when that statement comes in, but at present I have no further questions to ask Mr. Eliason. I suggest tomorrow because I am very hopeful that we may be able to close this case before the end of the week.

THE WITNESS: It is going to be very difficult to get that information by tomorrow.

MR. ANDERSON: It may have to go over until Monday because there are a few odds and ends

that we may have to put in Monday, but I am going to work very hard to get the evidence through with as fast as I can.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 75. Mr. Eliason, there is only one point I want to make clear. In these statements that you have prepared has there been any charge made for plant?

A. Why, I would say no to that question. It is contrary to the policy, at least.

RDQ. 76. In other words, the duPont Company had to build a plant costing half a million dollars to manufacture these products that are included in these statements, did it?

A. No, our plant laboratory is carried as a capital asset.

XQ. 77. Is there any charge made in these statements for any portion of the Wilmington expense?

A. No.

RDQ. 78. Is there any charge in these statements made for this experimental work, called general accounts, or is it only specifically what was actually spent in the laboratory?

A. Only what was spent in the laboratory.

RDQ. 79. For instance, the salaries of the officers of the company, is there any portion thereof included in these statements?

A. No.

THE COURT: You mean the general officers?

MR. KRESEL: The general officers.

THE COURT: Such as president and——

RDQ. 80. I meant the executive officers, the president, treasurer, and so on. You so understood?

A. That is the way I understood the question.

RDQ. 81. That is the way I meant it to be. You will get us that information as soon as possible, will you, Mr. Eliason?

A. Yes.

MR. ANDERSON: I would like to ask a few questions.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 82. In view of your statement that no part of plant is charged into these items, I will ask you again if you can explain the item "Plant Process".

A. No, I cannot.

RXQ. 83. You do not mean to undertake to testify as to the items back of the general reports that come to you from the laboratory, on which your books are made up, do you?

A. No.

MR. KRESEL: Is that all with this witness?

MR. ANDERSON: That is all.

(Witness excused.)

MR. KRESEL: Now, Colonel, do you want to ask Dr. Bolton that question?

MR. ANDERSON: I think it is a very desirable question to have explained. I have no doubt it can be.

MR. KRESEL: Very well. Dr. Bolton, will you resume the stand.

ELMER K. BOLTON, recalled for further examination, having been previously duly sworn, testified as follows:

MR. KRESEL: You go right ahead. I will not ask him anything.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 468. Dr. Bolton, you have heard my questions to the witness who has just left the stand in regard to these items?

A. I have heard some of them.

RXQ. 469. Could you explain the meaning of the item, for instance, "Indigo and Derivatives, Plant Process, $67,387.96," under Federal Trade Commission License No. 19 Indigo? It is a little ambiguous.

A. When we are about to begin research work on any subject, whether it deals with the particular process used in the plant or the investigation of a modification of that process, an account is opened for that work, and it very often happens that the account titles are not strictly a description of the work which is carried out.

I do not recall offhand just what work was charged to this account. There are so many accounts that I do not try to keep that. But what I believe it is is the following: They evidently had some difficulty with the plant process. We send a research man into the plant and he will stay there for a time to investigate the process and to find out where the particular trouble is. He then comes back into the laboratory and carries out a series of experiments for the purpose of trying to clear up that difficulty. That is what I believe was meant by this particular account.

RXQ. 470. That is what I thought. In other words, when you engage in the manufacture of a certain product, as in all other business, you find difficulties arise from time to time due either to ingredients or machinery or some need of improvement in process or development, and then you send a man there that is an expert to investigate that subject from your laboratory. He brings the results back into the laboratory and undertakes to improve the condition

which has brought about the trouble or which requires improvement; is that the idea?

A. That is correct.

RXQ. 471. During the period of manufacture.

A. Particularly in beginning the manufacture.

RXQ. 472. And that would be true of any stage in the manufacture. If it happened to them, you would do the same thing, would you not?

A. Yes, that is true, Colonel; but we do very little of that work today. There are a great many processes that we have that do not require our attention whatever, and in our organization as it is set up now, the supervising chemist of that operation is very often able to carry out sufficient experimental work to clear up the difficulties.

RXQ. 473. And that supervising chemist is a plant operative and not a laboratory man?

A. He is entirely distinct from our laboratory.

RXQ. 474. From your laboratory or your research work?

A. Yes.

RXQ. 475. The indigo, I believe you said, is not a patented dye and has not been for a number of years?

A. Yes.

RXQ. 476. There are certain ingredients, as I understand.

A. The patent for the process expired in—perhaps I better not try to give the date.

RXQ. 477. I think it was several years ago.

A. Yes, several years ago.

MR. KRESEL: I think it was in 1920.

THE WITNESS: Yes, that is my recollection, too.

MR. ANDERSON: Possibly. A little earlier, perhaps.

A. (Continued.) And there were also processes on making the phenylglycene, which is the intermediate for indigo according to the process which we used.

RXQ. 478. And that is one of the items here?

A. That is one of the items here.

RXQ. 479. That is the first item, if I recall it, under this license No. 19?

A. Yes, sir, and that license No. 19 contained patents for phenylglycene and other indigo in which we were interested.

RXQ. 480. Now, the item you have here charged of $114,066.91 is to indigo strictly and not the intermediate?

A. No. We have tried to make that separation where all the expenditures to indigo or some phase with the finished product are charged to indigo.

RXQ. 481. To indigo?

A. To indigo.

RXQ. 482. Now "Indigo and Derivatives-Synthesis" you have charged $10,187.89. Could you tell me briefly what "Indigo and Derivatives" mean. I am not asking you a very intelligible question, but is that something that is derived from the indigo dye?

A. That, strictly speaking, and the derivatives are made from indigo by chemical processes.

RXQ. 483. In other words, you develop some branch, you might say of the indigo dye, some modification or some slight change in the color?

A. Yes. Now, I do not know just what was charged to that. The only indigo derivative which we are making at the present time is indigo carmine, and I have noticed that we have special accounts for indigo carmine, and all the work which was done on the sulphonation of indigo for indigo carmine were evidently charged to that account; but as I say, those general

names are sometimes misleading, and this may be a case of it.

RXQ. 484. Now, indigo oxyethylaniline method, is that right?

A. Oxyethylaniline method.

RXQ. 485. Was that one of your patent methods, or was that a method you developed in your laboratory?

A. No, that is a method which is described in the German literature of making indigo from oxyethylaniline, and we carried out some experimental work to find out the ease of the reaction to see whether we were interested in that particular process.

RXQ. 486. You have gotten an item "Semi-works." What do you mean by "Semi-works"?

A. We had a small semi-works indigo plant. It was a miniature indigo plant, which was capable of producing ten or fifteen pounds of product, and that account evidently covers the work which was done with that particular plant.

RXQ. 487. Now, you have got down here "Indigo and Derivatives Plant Process, $9,376," which is the item J 154 and J 54, "Indigo and Derivatives Plant Process, $67,387.96." The designation is exactly the same. Can you state what the difference is from memory?

A. Colonel, I would prefer not to make any attempt to state the difference. If you are interested in that information I can get it for you, but I would not want to try to guess what it is.

RXQ. 488. I am merely trying to get at the meaning of these accounts from the standpoint of charges. I do not want to go into your figures. Now, Doctor, take the item under "License No. 18-A, manufacture of sodium hydro-sulphite, $43,000" and other items aggregating $59,000. Could you explain what those

items mean? You had better look at them perhaps. (Handing paper.)

A. You will notice that the first account number was R-128-B. Before the erection of our research laboratories at the dye works we were carrying out experimental work in two other laboratories. One was the laboratory located at Gibbstown, and the other this experimental station outside of Wilmington. This work on the manufacture of certain hydro-sulphite covered by this account, was carried out at the laboratory located at Gibbstown, and that includes a laboratory and a semi-works investigation of the method of making sodium-hydrosulphite. Now, the other item of any size is J-15-65-6, amounting to $13,797.71. This work carried out at the eastern laboratory located at Gibbstown was then duplicated at the Jackson laboratory, and we had a small semi-works plant there to check over once more the information which had been acquired in the earlier experimental work. As for the very small items, the other two items, I do not recall what they are.

MR. ANDERSON: That is immaterial. I merely wanted an explanation of the character of charge to manufacture.

RXQ. 489. Who made the distribution of these charges in the laboratories to the various symbolized accounts here, do you know?

A. When a chemist begins a new investigation, he receives from our accounting department a charge number which you have designated on the side. All the materials which he orders during the course of his investigation are charged to that particular account. He goes to the storeroom and gives them a charge number and that is recorded there and that record is then sent to our accounting department located in the Jackson laboratory.

As for the time distribution, at the end of the

month, he reports to his superior the amount of the time during the month which he spends against each product which is active at the time. That is an arbitrary division, but he tries to make it as accurate as possible. One account may receive 60 per cent. of his time; another may receive 40, if he is working on two subjects.

RXQ. 490. And then who distributes the general laboratory expense like manager, and other persons whose time is not devoted to any specific work, but who are general employes or officers?

A. That is done by our branch accounting department located in the Jackson laboratory, where all these accounts are kept.

RXQ. 491. Then they report their accounts over to the general office and they are carried to the general books, from which these statements are made up.

A. Yes.

MR. ANDERSON: I do not think I have any further questions, sir.

MR. KRESEL: That is all, Doctor.

(Witness excused.)

MORRIS R. POUCHER.

MORRIS R. POUCHER, called as a witness in behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. What is your address, Mr. Poucher?

A. Wilmington, Delaware.

Q. 2. And what is your business?

A. I am a director of E. I. duPont de Nemours & Company.

Q. 3. How old are you, Mr. Poucher?

A. Sixty-four.

Q. 4. Where were you born?

A. Claverich, Columbia County, New York.

Q. 5. What has been your business experience?

A. Up to 1916—before that, the end of 1915, I was a vice-president of the Badische Company in New York.

Q. 6. And since then?

A. I have been in Wilmington, connected with the duPont Company.

Q. 7. When did you first become connected with the duPont Company?

A. September, 1916.

Q. 8. When did you sever your conection with the Badische Company?

A. It was along in 1915. I have forgotten the exact date.

Q. 9. How long were you with the Badische Company?

A. Around thirty years.

Q. 10. Was this Badische Company a corporation or a firm?

A. A New York corporation.

Q. 11. And what was its business?

A. They were importers of coal tar dyes, manufactured by the Badische Anilin and Soda Fabrik.

Q. 12. And where was the Badische Anilin and Soda Fabrik?

A. Ludwigshafen.

Q. 13. What country?

A. On the Rhine, Germany.

Q. 14. How long a period while you were with the Badische Company did that company have business relations with the Badische Anilin and Soda Fabrik?

A. The entire time.

Q. 15. For how many years was the business in New York conducted under the name of the Badische Company?

A. I think it was 1906 that that corporation was formed; either 1906 or 1907.

Q. 16. Under what name was the business in New York conducted prior to the incorporation of the Badische Company?

A. Under the name of Kutroff-Pickhardt & Company.

Q. 17. Was that a corporation or a firm?

A. That was a New Jersey corporation.

Q. 18. Prior to the organization of Kutroff-Pickhardt & Company, was there any other organization or firm or co-partnership preceding that?

A. There was a firm before that.

Q. 19. And what was its name?

A. William Pickhardt & Kuttroff Company, and on the death of William Pickhardt, it became Kuttroff, Pickhardt & Company.

Q. 20. Do I understand that under these three names that you have now given, the business in New York was conducted and that you were connected with it for how many years?

A. Nearly thirty.

Q. 21. You said, I think, that you were vice-president of the Badische Company?

A. Yes, sir.

Q. 22. What part of the business did you take care of?

A. The business was divided in parts; that is, the marketing of certain products; and my part was the introduction into commerce of certain inventions as they came along, including synthetic indigo and subsequently of the vat colors.

Q. 23. Those were products of the Badische Aniline & Soda Fabrik; both of those two were?

A. Yes.

Q. 24. I ask you whether the New York business during the entire time that you were connected with it, whether it was a firm or corporation, sold the products of people generally or confined itself to products of some particular corporation?

A. Exclusively the Badische.

Q. 25. Exclusively the products of the Badische Anilin & Soda Fabrik?

A. Yes, with these exceptions, possibly, of some products and some chemicals that might have been used in connection with the coal tar colors, but of minor importance. They did not amount to anything.

Q. 26. May it then be stated, Mr. Poucher, that the Badische Company of New York and its predecessors were the American representatives of the Badische Anilin & Soda Fabrik?

A. That is a correct statement of it.

Q. 28. Did this American business have any branches other than that in New York?

A. We had branch offices, branch selling offices in all the textile centers: Boston, Providence, Fall River, Philadelphia, Greensboro, North Carolina, Charlotte, Chicago, San Francisco, and, at one time, in Montreal.

Q. 28. Generally speaking, Mr. Poucher, what was the nature of the products produced by the Badische Anilin & Soda Fabrik, which your company marketed in America?

A. I should say the most important products were what is known generally in the textile industry as the fast colors.

Q. 29. Well, was it exclusively dyes?

A. Dyes, yes.

Q. 30. Were there any pharmaceuticals?

A. No pharmaceuticals, the Badische did not manufacture any.

Q. 31. Now, were there in the United States, prior

to the outbreak of the European War, agencies of other German dye and pharmaceutical factories?

A. Yes.

MR. KRESEL: I trust your Honor does not think that I am going over old ground. I am just laying the groundwork for a question. I do not intend to go over any ground that has already been covered.

Q. 32. Now, will you state the names of the German concerns so represented in the United States, and the names of their agents here?

A. Metz represented Hoechst, the Bayer Company by their own house here, the Bayer Company. Berlin by the Berlin Company.

Q. 33. It had a concern here called the Berlin Company?

A. It had a concern here called the Berlin Company; and Badische was represented at the outbreak of the war by the corporation known as the Badische Company here. There were several other small ones, but those are the leading ones.

Q. 34. And generally speaking, Mr. Poucher——

A. I might also mention the Caselli Company, that was represented by the Casselli Company in New York, and formerly by William J. Matheson.

Q. 35. Generally speaking, Mr. Poucher, was it the fact that these agencies in the United States were selling agencies for their principals in Germany for their products?

A. For their products, yes.

Q. 36. During the thirty years that you were associated with the Badische Company and its predecessors, did you keep yourself informed of the supply of dyes by way of imports from abroad and by way of domestic manufacture?

A. Yes.

Q. 37. And are you familiar and were you familiar

in 1919 with the development of the dye industry in the United States prior to the outbreak of the European War?

A. I think so.

Q. 38. Mr. Poucher, could you state what caused you to leave the Badische Company?

MR. ANDERSON: If your Honor please——

MR. KRESEL: Is there any objection to that?

MR. ANDERSON: Yes. I do not know what the answer may be, but I do not see how the question of how Mr. Poucher left the Badische Company is a matter which can affect the rights of the United States in this case in any way. I am a little in the dark. It may be material and it may not be material.

THE COURT: Will you tell us the purpose, Mr. Kresel.

MR. KRESEL: Your Honor, it is a matter personal to Mr. Poucher, and if Colonel Anderson does not want it brought out, I shall withdraw the question.

MR. ANDERSON: I have no objection if it is a matter upon which Mr. Poucher feels that his position would be better explained. As a matter of personal courtesy to Mr. Poucher, I have not the slightest objection, but if it has any bearing on the case and is a matter of evidence—I do not know what it is.

MR. KRESEL: Never mind.

THE COURT: I understand, Mr. Kresel, the objection is withdrawn.

MR. KRESEL: I withdraw the question.

MR. ANDERSON: I am very glad to withdraw the objection if it is a matter of courtesy to Mr. Poucher.

THE COURT: Did I say that I understood the objection was withdrawn? I meant to say that—

not that the question was withdrawn. I understood that was your position entirely.

MR. KRESEL: I am sorry, sir, I did not so understand it, and I am very glad Colonel Anderson has withdrawn the objection. I would like to have the question answered.

THE COURT: I was just wondering whether I had said question, when I should have said objection.

MR. KRESEL: No, your Honor said "objection," but I was thinking that your Honor meant "question".

MR. ANDERSON: Yes, of course, reserving any right as to anything I think is immaterial to strike out that matter. But, as a matter of courtesy to Mr. Poucher, I am glad to have him answer the question.

Q. 39. Will you state, Mr. Poucher, the circumstances of your severing your connections with the Badische Company?

A. Well, it was one of those things that is more or less unpleasant, of course, in an old relation that had existed for many years, and it came about over the affair of the Lusitania. That drew the line, unfortunately, very sharply. Some were in sympathy, some were not. An old business that had existed for a great many years, with a number of people—that was the end of it.

Q. 40. I would like you to state, Mr. Poucher, somewhat in detail what you have done since you have been with the duPont Company, if you did anything, in the development of their dye business.

A. I came down here in September of 1916, and a study was made lasting from that period until July—the early part of July, 1917—a general study and survey of the industry. In the early part of July, 1917, an announcement was sent out to the effect that the

duPont Company intended to enter this field, and the preparation for that, preparatory work, and so forth, was pushed very rapidly. Some of the plants, the early plants, came into commission in the early part of 1918. I was the director of sales and that business has been carried on from that time to this.

Q. 41. And where are the plants located?

A. Across the river, at Deep Water.

Q. 42. Here in Delaware?

A. State of New Jersey. Deep Water is in New Jersey, on the other side of the river.

Q. 43. Could you state approximately how many men are employed in that industry now by the duPont Company?

A. I cannot tell you the exact number as it stands now.

Q. 44. Approximately.

A. It is quite large.

Q. 45. During the war, Mr. Poucher, did you have any official position?

A. None outside of this industry, with the exception of the War Trade Board. I was on the Advisory Committee of the War Trade Board.

Q. 46. Any particular branch of industry that your Advisory Committee had charge of?

A. There were seven members of that Dye Advisory Committee to the War Trade Board, three textile manufacturers and three dye manufacturers, and one, Doctor Herty, who was at that time, I think, the president of the American Chemical Society.

Q. 47. You know Mr. Garvan?

A. I do.

Q. 48. When did you first meet him?

A. I think it was in—oh, the date of a letter. There is an exhibit here that would fix the date, I think.

MR. ANDERSON: June, 1918.

THE WITNESS: 1918.

Q. 49. You were introduced to Mr. Garvan by Mr. Patterson?

A. By Mr. Choate, I think, as I remember.

Q. 50. Mr. Choate?

A. I think so.

Q. 51. Who introduced you to Mr. Choate?

A. Mr. Patterson.

Q. 52. Had you known Mr. Patterson for some time before that?

A. Many years, yes.

Q. 53. Was he in the textile industry?

A. Yes, sir, he was a woolen manufacturer at Waterloo, New York.

Q. 56. The date of the letter is some time in June, 1918. From that time on did you have occasion to confer with Mr. Garvan or Mr. Choate, or both of them?

A. I saw both of them, of course, many times.

Q. 55. Where did you see them?

A. I think we met first at their New York office on Forty-second Street.

Q. 56. Whose New York office?

A. The Alien Property Custodian's New York office, Forty-second Street, off of Sixth Avenue, and then in Washington.

Q. 57. I am not going to ask you, Mr. Poucher, to detail the many conversations that you had with these gentlemen, but what was the subject that you and they were discussing?

A. I had been here in Wilmington two years, nearly two years, when I received a letter from Mr. Patterson. He asked me to meet Mr. Choate and also Mr. Garvan. My remembrance is that he gave me a letter of introduction to Mr. Garvan, as I recall it. I called at the office and I think he was engaged, or something of that sort, and I met Mr. Choate first. I was introduced to Mr. Garvan by Mr. Choate. Mr.

Choate made a number of inquiries, asked me a good many questions about the industry abroad.

Q. 58. What industry?

A. The dye and chemical industry abroad. I gave him all the information that he asked for and subsequently met Mr. Garvan and gave him all the information that he asked for.

Q. 59. Have you ever been a member of the American Dyes Institute?

A. I have; yes, sir.

Q. 60. When did you become a member of that?

A. From the very beginning.

Q. 51. When was it organized?

A. I can give you the date if you will allow me to refresh my memory. That was in April, 1918.

Q. 62. Did you hold an office in that organization?

A. I was on the executive committee, as I remember.

Q. 63. I will ask you, Mr. Poucher, whether you are familiar in a general way with the charges that are made in the complaint in this case?

A. I have read them.

Q. 64. Particularly with reference to the allegations therein made as to the American Dyes Institute; have you read those?

A. I have read them.

Q. 65. I wish you would in a general way state to the Court what the activities of the American Dyes Institute were during the war, more particularly with reference to the dyes industry. I wish you would do it as briefly as possible.

A. It is pretty well covered in the introduction, in the preamble that is given in the book of the Dyes Institute or the first records of the institute as to its object.

Q. 66. You mean the minute book?

A. The minute book. I think it is in the minutes

of the first meeting, if I am not mistaken. The institute was organized for the purpose of bringing together all those who were interested in the development of the dye industry, a new industry in the United States, with a view to securing the co-operation of all manufacturers in certain problems which we were sure we were going to have ahead of us. As an industry, we were very young. Everybody else was. There were very few who had had any experience at all in the industry, but there were certain subjects that we were sure we were going to have ahead of us, certain problems. We were certain that we were going to have a legislative problem. It was only a question of time when we should have to have some sort of adequate protection for the industry in this country. We had a number of other questions that developed as the institute grew and we appointed from time to time various committees to take charge of that work.

One of the earliest subjects that came up, with which a number of the members were more or less familiar, was the subject of graft, which, as manufacturers, we were trying very hard to eliminate. We had a committee that made a very thorough study of the subject and aimed to obtain some sort of Federal legislation on the subject. That has since grown into a movement, entirely apart from this industry, and extending to other industries; and we have been very much in hopes that something very good would come of it.

We had another committee that studied the subject of cost accounting, and that was brought about along in the spring of 1919. There was no uniformity of system among the different manufacturers, and the question came up—if I am not mistaken, it was brought out by the Tariff Commission before the Ways and Means Committee at one of the hearings, in questioning the different systems of accounting. Now, that

was taken up with the Tariff Commission, and we had a committee appointed that worked out a very good plan, and the committee finally made a report which was printed, and pretty widely circulated. The chairman of that committee was Mr. Gaines of the Calco Company.

Then a tariff committee was appointed that made a study of the industry itself, that is, the needs of the industry for a tariff. When that work was completed, there was another committee, the legislative committee, which took up the report of the tariff committee covering the needs of the industry, and carried it on from that point. I was the chairman of the legislative committee, and the full text of the proceedings, that is, of the activities of that committee, I testified to before the Shortridge Committee.

Q. 67. I was going to ask you about that.

A. I believe there is a full report of that in the Shortridge Committee, so I need not speak of that any further.

Q. 68. I meant to ask you about your testimony before the Shortridge Committee. Was that the only occasion on which you testified before any of the Congressional Committees that investigated The Chemical Foundation and the dyes industry?

A. Yes.

Q. 69. You may proceed; and when was that testimony given?

A. The Shortridge Committee?

Q. 70. Yes; just what year?

A. I can give you the date of that. That was March 10 and 11, 1922—my own testimony I am speaking of. The hearings, of course, covered a considerable length of time.

We had another committee on the subject of industrial alcohol. The manufaturers were concerned with the Internal Revenue Department, and there were

a number of problems in conection with that, that had to be studied, which were for the mutual advantage of all members of the industry.

We had another committee on the subject of the standardization of chemical terms, that is the nomenclature and spelling and pronunciations of chemical terms, as is applied to the dyestuff industry, and that was a committee that gave a great deal of study to the subject, and I think they have made a very great contribution to the literature on the subject.

Q. 71. Now, I think, Mr. Poucher, you have sufficiently indicated——

A. There is one more I would like to speak of, if you do not mind, because it was a matter that turned out to be of a good deal of importance, and that is the subject of sanitation and safety, which was the working out or taking the experience of all the manufacturers in the matter of explosions and accidents and that sort of thing, and getting that information all together so that all the members of the industry might have the full particulars and all the details and information and help that might come from it.

Q. 72. In 1919, do you recall the American Dyes Institute being interested in the German patent situation

A. Yes, I do.

Q. 73. Were you officially connected in any way with the transaction resulting in the sale of the patents here in question to The Chemical Foundation?

A. We had a committee of the institute that was appointed for the purpose of studying the matter, and meeting with the Alien Property Custodian, and the first meeting of that committee was in Washington, as I recall it.

Q. 74. Were you a member of that committee?

A. I was; yes, sir.

Q. 75. Now, did you or did you not take part in

any conferences with representatives of the Alien Property Custodian, with reference to the sale by him of these German patents, covering dyes and chemicals?

A. I did.

Q. 76. Mr. Poucher, the Government in its bill charges that beginning about June, 1918, certain chemical concerns in the United States whose names are given and others whose names are not given entered into a conspiracy to induce the Alien Property Custodian to seize the German patents here in question, and, further, to organize The Chemical Foundation and to induce the Alien Property Custodian to sell those patents so seized to The Chemical Foundation; and it is charged that the purpose was to perpetuate a monopoly of the dye industry which these conspirators had theretofore obtained. It is charged in the bill that you, Morris R. Poucher, are and were the representative of the duPont Company, one of the conspirators. Indeed, your name is the only one that is mentioned as a conspirator, other than the corporation's.

Now, I am going to ask you, first, generally, whether you have taken part in or been a part of any conspiracy in connection with the dye industry, the establishment thereof, the seizure of these patents, or the sale thereof?

MR. ANDERSON: If your Honor please, I have no objection to the witness stating fully and at length, at any length counsel and the witness may desire, whatever he did in connection with these matters; whether it be relevant or irrelevant is immaterial.

However, I do not think the witness can testify whether he took part in a conspiracy, in that form, for the reason that that is a conclusion of law to be drawn from the facts. I have not the slightest objection to the fullest possible state-

ment of the facts, and I shall not object to this evidence on any ground whatever, either now or at any other time; but I do object to the conclusion—it is a conclusion to be drawn by the Court from the facts.

MR. KRESEL: In other words, the Government reserves unto itself the right to charge a man with a conspiracy, using the legal term, and using the legal conclusion, without stating a single fact in support of that allegation, yet denies to that man the right in his own defense to say that he was not a conspirator.

MR. ANDERSON: I do not think that is a fair statement of the bill, sir. If it is, the Government stands by it. I want to repeat, I will not object to any evidence that Mr. Poucher wants to give as to any facts, statements or activities in the broadest terms. But the statement of the bill contains many facts, as we think, bearing upon this subject and states the usual language of the charge, the conclusion, which probably is not necessary but is usual in bills of this kind.

Now, that is pleading. The evidence is mere statements of facts. If those facts do not support the conclusion there stated, why, it is for the Court to determine. I want to make it as plain as I can make it on this record that I am not going to object either at this time or at any other time to Mr. Poucher making a full and complete statement of his connection with this matter.

THE COURT: My memory does not aid me in recalling the facts which are pleaded, and that is a matter which can be quickly ascertained. Will you do that, Mr. Kresel?

MR. KRESEL: Certainly, your Honor. The bill starts out in the twenty-third paragraph of the bill:

"Complainant is informed and believes and therefore avers that in pursuance of said plan, scheme, and conspiracy the persons, firms, corporations, and associations aforesaid, parties thereto, about or soon after June, 1918, through their duly authorized representatives, and especially through one Morris R. Poucher, representing and acting for said conspirators, approached said Alien Property Custodian and certain of his assistants, and especially Francis P. Garvan, who was then and for a long time prior thereto had been chief of the Bureau of Investigation and also director of the New York office of the Alien Property Custodian,"

I shall skip some verbiage there, your Honor, which is not material. It then describes Mr. Choate and his position, Mr. Hoguet and his position, and continues by alleging:

"and thereupon the said persons, firms, corporations, and associations, through their representatives aforesaid, and especially through said Morris R. Poucher, aforesaid, urged upon said Alien Property Custodian and his assistants, officers, and agents aforesaid, and others, the pretended necessity for the protection of American industry of securing control or ownership of said enemy-owned patents, copyrights, trademarks, labels . . . and urged upon them their pretended duty in the public interest to seize, sell, or dispose of the same; and after numerous conferences with said Alien Property Custodian, his assistants, officers, or agents aforesaid, said parties succeeded in inducing them to undertake the seizure of said patents," and later the sale thereof is alleged.

This allegation, wherein Mr. Poucher is so distinguished, is preceded by allegations in this bill of the formation of the alleged conspiracy by cer-

tain firms and corporations, and your Honor will find in the twentieth paragraph on page 20 that the names of the alleged conspirators are given as follows:

"that by or before June, 1918, the aforesaid plans and purposes for the complete control and monopolization of said dyestuffs and chemical industry had developed to a point where the essential basic and intermediate ingredients in the manufacture of dyes and many of the essential chemicals used and necessary in connection therewith were controlled by a limited number of corporations, working in close alliance with each other, chief among these being the National Aniline & Chemical Company, which had been formed in 1917 through the consolidation of numerous corporations then engaged in the manufacture, sale, and distribution of dyestuffs and chemicals and the ingredients thereof, the General Chemical Company, the Solvay Process Company, the Semet-Solvay Company, the Barrett Company, and E. I. du Pont de Nemours & Co."

Chief among those. That is the reason why, your Honor, throughout this case I have emphasized the fact that the Government has charged a conspiracy against the whole chemical industry of the United States. They were not content with charging that the corporations whose names I have just read were in this conspiracy, but they say that those were only the chief culprits, that the entire chemical industry of the United States were banded together to defraud the Government of the United States, in order to perpetuate a monopoly that had been established.

I say that when the Government charges in such general language a conspiracy of such a broad nature and mentions one man by name and says that he was especially active in that con-

spiracy, it does not lie in the mouth of the Government to protest against that man being permitted to say, "No, I am not a conspirator," and to say it in so many words, and not by compelling him to answer specific questions as to what he said to one man and what he said to another.

Why, your Honor, the meanest thief in his defense is permitted to say that he did not steal, and many a man charged with making false representations, upon which he obtains goods worth ten dollars, is under the cases permitted to say, "No, I did not intend to make a false representation."

Now, Mr. Poucher can be asked the specific questions, and I propose to do it. I propose to take up each one of the paragraphs of this complaint and ask him whether he did or did not do the things that are alleged; but I want this man to have the opportunity to put upon the records of this court, where his children and his grandchildren can read it, that he was not a conspirator; and it does not lie in the mouth of the Government to deny him that right.

I press my question.

MR. ANDERSON: I only want to say, sir, that the Government has no desire to deny Mr. Poucher any right whatever. I have stated my reasons. There are certain rules of evidence that stating a conclusion is not stating the facts. Now, pleading is one thing and evidence is another. If the matter is going to be put upon the ground upon which counsel has put it, I am perfectly willing to let Mr. Poucher state his conclusions. I have said that I was not going to object and I have not made any objection to evidence of this kind——

THE COURT: Objection withdrawn?

MR. ANDERSON: I am perfectly willing to withdraw the objection.

THE COURT: I do not care whether you do or do not. I only want to know which you are doing.

MR. ANDERSON: In view of the statement of counsel, while I think the objection, if insisted upon, would be well taken, I am going to withdraw it. Let him state conclusions or facts. It does not make the slightest difference to me. He can go through it any way he wants to.

THE COURT: You may take the answer.

By THE COURT:

Q. 77. Do you recall the question, Mr. Poucher?

A. I do.

By MR. KRESEL:

Q. 78. Will you answer.

A. The answer is no.

Q. 79. Did you or did you not conspire with the defendant or any other person to cause the seizure and sale of any enemy-owned patents for the purpose of furthering the purpose and intent of any one to monopolize any kind of trade or commerce?

A. No.

Q. 80. Did you or did you not intend to participate in any conspiracy or monopoly in any wise having to do with the dyes industry or any enemy-owned patents?

A. No.

Q. 81. So far as you made any representations to the Alien Property Custodian or any of his representatives, did you tell him or them anything that was not true?

A. I did not.

Q. 82. Did you ever talk to President Wilson upon this subject?

A. No, I never met him.

Q. 83. Did you ever talk to Mr. Polk upon this subject?

A. No, I never met Mr. Polk, until he came to Wilmington to testify in this case.

Q. 84. Did you ever make to them or either of them, directly or indirectly, any representations?

A. No.

Q. 85. Did you or did you not cause or procure any person to make any misrepresentations or to suppress any information from the Alien Property Custodian or any of his representatives?

A. No.

Q. 86. Did you have anything to do, directly or indirectly with maintaining or continuing any monopoly in the dye industry in the United States?

Mr. Anderson: Now, sir, I have to object. If it comes down to what Mr. Poucher did do, I have allowed a number of questions which in my judgment were clearly illegal, but there is a limit. I think there is a legal way of taking evidence and an illegal way. I am perfectly willing to stretch the limits so far as I can in a legal way. But when it comes down to evidence taken in an illegal way, I think it is my duty to object and ask that it be taken legally.

Mr. Kresel: When the Government alleges that there is a monopoly, I have a right to call the man whom they charge with maintaining the monopoly to deny it; and a way of denying it is not by showing how many pounds one makes and how many another and what the total is and compare one with the other. The man who is charged with doing it has a right to categorically deny it and that is my purpose in putting the question to this man.

The Court: What are the facts pleaded with respect to a monopoly?

MR. KRESEL: Let me read them to your Honor. I will be very glad of the opportunity. I read from the eighteenth paragraph of the bill on page 19:

"Complainant is informed and believes and therefore avers that for several years prior to the declarations of war aforesaid various persons, firms, and corporations (not naming them) engaged in the production, manufacture, and sale of dyes, and the ingredients thereof, and of kindred or similar chemical materials and products."

THE COURT: Those firms are named, I assume, elsewhere.

MR. KRESEL: No, your Honor. The naming of the firms in the twentieth paragraph is in connection with the limited number of corporations that controlled essential chemicals and dyes. There is no charge there that those are the persons who had monopolized.

THE COURT: I assume you are mistaken, Mr. Kresel. I say that with a great deal of hestitation. I will get you to point that out, Colonel Anderson—the place where the conspirators' names are set forth.

MR. ANDERSON: I think in the twentieth paragraph the specific persons are named. This is the inducement leading up to the twentieth paragraph and it states there that about June or after June, 1918, these persons acting together had reached practically a monopolization of this industry and then in each paragraph thereafter, it is alleged that in pursuance of that arrangement or scheme entered into, they did this and they did that, the usual form of pleading in such case.

MR. KRESEL: I do not like to put questions to the opposing counsel, but inasmuch as the question has been raised, I should like to ask Colonel

Anderson if he will read from the bill the names of the persons that are the conspirators.

MR. ANDERSON: "The persons named," and the persons whose names you read a moment ago "and others to the complainant unknown."

MR. HERSHKOPF: There is no allegation that they are unknown.

MR. KRESEL: The twentieth paragraph does not state the conspirators. The twentieth paragraph is as follows: "Complainant is further informed, believes and therefore avers that by or before June, 1918, the aforesaid plans and purposes for the complete control and monopolization of said dyestuffs and chemical industry had developed to a point where the essential basic and intermediate ingredients in the manufacture of dyes and many of the essential chemicals used . . . " were controlled by certain corporations that you name and others; but where is the allegation that they are the conspirators whom you mean, if they are not found in the paragraph that I read? The eighteenth paragraph says, "various persons, firms, and corporations engaged in the production, manufacture," and so on.

MR. ANDERSON: Very good. If it is not sufficiently in the pleading—let them come to it.

THE COURT: My difficulty is not that, Colonel Anderson, at this minute. My trouble is this: That if the charge is a blanket one, and I assume that you would show me that probably now, because I have been going to ask you just exactly what the facts constituting the charges of conspiracy as pleaded by you are, I am going to ask you to show me from the bill who the conspirators are, not for the purpose of testing your pleading, but for the purpose of determining how such charges may be met, because I assume that the

Government of the United States has in its possession facts warranting the allegations before they are made; and I assume that the United States will not make a blanket charge of conspiracy, a serious charge, without having facts to support it, and if it has those facts, I assume it would plead them with sufficient particularity to enable the defendant to meet them. So I will get you to point out those facts to me if you will be good enough, Colonel Anderson.

MR. ANDERSON: Certainly. I will do that. I will be very glad to do it now.

THE COURT: A conspiracy is one of the most difficult things in the law to establish, and if established is one of the most difficult to disprove.

MR. ANDERSON: I think so, sir.

THE COURT: The conspiracy to be established is that one charged in the bill of complaint, of course, and it is the only one which the defendant is called upon to meet. Now, unless there is a definite and specific charge set forth in the bill of complaint—I do not know whether there is or not, I assume there is, because the bill was filed by the Government of the United States——

MR. ANDERSON: If there was not, I should think the place to raise that, your Honor, would be on the original motion, and if you desire me to argue the motion now, I am perfectly willing. I am objecting to the evidence on the ground that it does not relate to a conspiracy. I am objecting merely to the form.

THE COURT: But there are two things, it seems to me, that I have got to consider with respect to that, and as soon as I can determine those I am prepared to rule. The first of those things, if I were confronted with a proposition of what testimony I must give in defense, my basic in-

quiry would be first, what are the allegations with respect thereof in the bill of complaint? With respect to conspiracy, my recollection of the law is that it must be pleaded, not according to legal conclusions—I do not know of any pleading in Delaware which is a pleading of legal conclusions, but it must be a pleading of fact. My first inquiry, therefore, would be to ascertain what the facts pleaded are. My second inquiry would be what are the proven facts, establishing the allegations.

MR. ANDERSON: I will be very glad to answer your question to the best of my ability. It will take me time, but I will do it with great pleasure.

THE COURT: Will you be kind enough, Colonel Anderson, to do it with respect to the bill of complaint, first pointing them out to me and stating them to me generally?

MR. ANDERSON: I will, sir. I will take the bill immediately.

THE COURT: If you will just indicate the paragraphs to me, you need not read them particularly.

MR. ANDERSON: I shall be very glad to do that. I think the charges begin on page 18, and they contain the statement, on page 19, that the importation was automatically stopped by the war, and on page 20 that the complainant is informed——

THE COURT: Are you speaking of paragraphs?

MR. ANDERSON: I am speaking of paragraphs, sir, at the twentieth paragraph, where "Complainant is further informed and believes" . . . that a number of corporations, including chief among them the National Aniline & Chemical Company, the General Chemical Company, the Solvay Process Company, the Semet-Solvay Company, the Barrett Company, and the E. I. du Pont de Ne-

mours & Company succeeded in substantially monopolizing this industry, and it further charges that this had been accomplished by means of agreements with those persons and others associated with them in like business made through certain trade associations, "among others the American Dyes Institute, the Chemical Manufacturers' Association of the United States, the Textile Alliance, Inc."—the Textile Alliance of the United States now stricken from the bill—"and their affiliated organizations, of which the persons, firms, and corporations engaged in the manufacture, sale, and distribution of dyes and chemicals" . . . , "Complainant is informed, believes, and therefore charges that through and by means of the methods, agreements, and organizations aforesaid, there was in June, 1918, and has since continued, an organized and united control and monopoly of the manufacture, sale, and distribution of dyes and the ingredients thereof, and of chemicals related thereto or used in connection therewith in the United States; and that said combination, monopoly, and control has since been further developed and perfected by and through the consolidation in 1920," of various companies into the Allied Chemical & Dye Corporation. It then goes on and takes up the question of the issue of these patents and the amendments to the act, and so forth, and that after the signing of the Armistice, in the twenty-third paragraph that: "Complainant is informed and believes and therefore avers that in pursuance of said plan, scheme, and conspiracy the persons, firms, corporations and associations aforesaid," entered into said plan and scheme of conspiracy, and that about or soon after June, 1918, these parties undertook to induce, and did finally induce the

Alien Property Custodian to seize these patents which have controlled this industry in the United States, and that said parties succeeded in inducing him to seize the patents, and the signing of the Armistice agreement made necessary the accomplishment of this purpose, and that prompt action should be taken, and said parties "thereupon arranged with the Alien Property Custodian immediately following the enactment of said amendment approved November 4, 1918, of the 'Trading with the Enemy Act'," to have the patent attorneys of the du Pont Company and the National Aniline & Chemical Company, and their necessary assistants employed by said corporations, and by the American Dyes Institute, stationed at the Patent Office at Washington, so that they should proceed to seize these patents, copyrights and trademarks on the list selected by the attorneys?

THE COURT: There is no evidence in support of that in the case, so far as I recall, is there? My recollection is that Mr. Gordon was your witness and he denied that. That is my recollection.

MR. ANDERSON: Your recollection is entirely different from my own, sir, but I may be mistaken. My recollection is that Mr. Barrows and Mr. Squair representing these two companies, and the documentary evidence showed that at that time, and the correspondence also, was sent down to Washington and selected those patents out of the Patent Office, and turned over the copies to Mr. Gordon, who thereupon examined the title and drew up the demands and had them O.K.'d by Mr. Hoguet, and then they were signed by the Alien Property Custodian himself.

THE COURT: My recollection is that the only evidence is the Gordon evidence; is that correct?

MR. ANDERSON: The documentary evidence,

the correspondence, is very elaborate on that subject, and the bills and the expenses and the payments and everything are in evidence.

MR. KRESEL: Your Honor's recollection is entirely correct. Mr. Gordon testified that all that these two lawyers did was to obtain for him copies from the Patent Office of a lot of patents.

THE COURT: Because of their knowledge of what the patents were?

MR. KRESEL: Of what they related to.

THE COURT: Yes.

MR. KRESEL: That then, he, representing the Alien Property Custodian, and his staff, searched the titles to the patents; that he and Mr. Hoguet and Mr. Palmer then determined which, if any, of those to seize; that they prepared the demands; and that the demands were O. K.'d by Mr. Hoguet and presented to Mr. Palmer for his signature. That is the evidence.

MR. ANDERSON: Your Honor, I will not be so positive as to my statement as counsel is, because my capacities are so limited that I cannot carry a thousand pages of evidence in my head and state exactly what each person testified to. I will do that when I come to argue this case before the Court, if we ever reach that point. My understanding of the evidence is entirely different, both the documentary and the oral.

THE COURT: I do not have any recollection of any documentary evidence tending to establish that Messrs. Barrows and Squair were acting in any way other than as testified to by Mr. Gordon. I do not say there is no such evidence, because there are about a thousand exhibits, and a great many of them I have not heard read. But there is no question in my mind that the oral testimony

of Mr. Gordon is that they were asked to select these patents because of their familiarity with patents of that type and their knowledge enabling them to select them, and that thereafter the seizing of those patents took place.

MR. ANDERSON: The record shows, if your Honor please, that at the conference on the twenty-seventh day of January, 1919, Mr. Barrows was present at the office of the Alien Property Custodian; that prior to that time it had been suggested that the representatives of the National Aniline and duPont Company would aid in the selection of these patents for seizure, and they were seized. The correspondence shows that that arrangement was made; that Mr. Barrows and Mr. Squair went to Washington in accordance with that arrangement; shows the payments that were made to them in connection with the expenses, and the arrangement by the American Dyes Institute, and that they selected the patents upon which Mr. Gordon worked up his seizure.

THE COURT: Mr. Gordon did not testify to that effect, as I recall, Colonel Anderson.

MR. ANDERSON: I would, of course, like to put the evidence of Mr. Gordon and the documentary evidence together, and I think I can demonstrate pretty conclusively that the evidence bears out my statement. But I do not know that we will get anywhere by a discussion of those two points.

MR. KRESEL: May I read it, sir?

THE COURT: I will hear you.

MR. KRESEL: There is no necessity of having the evidence taken into the record again, your Honor?

THE COURT: No.

MR. KRESEL: I read from page 1131 of the record, under cross-examination. (Reading.)

THE COURT: That is not what I mean. The answer that I recall is not one elicited by your cross-examination, but one given in the examination in chief.

MR. ANDERSON: I wish to make clear that my objection to this evidence of the witness now on the stand goes absolutely and solely to the point that he is asked to state a conclusion and not state facts. If he is asked to state facts, I shall not object to the evidence, and have not objected to it, however broad it may be, I am not objecting, but I want the fullest latitude in that regard. My objection is to the form, and not to the substance, and it was made accordingly.

MR. KRESEL: I think, your Honor, Mr. Mahaffy has laid his hands on the question and answer that your Honor had in mind. It was on the direct at page 1059. It reads as follows:

(Reads Q. 50, page 1059, from direct examination of witness Gordon.)

THE COURT: That is the answer I had in mind.

MR. KRESEL: Now, if your Honor please, I must say that the question as to whether this bill does or does not name the conspirators has not yet been answered. I find it this way, your Honor:

In the eighteenth paragraph of the bill the allegation is: "That various persons, firms and corporations engaged in the production, manufacture and sale of dyes, and the ingredients thereof, had been engaged in the formation and development of plans for a monopoly." If we stop there, there is no charge of conspiracy there at all. It is a charge that certain unnamed persons had been engaged in a monopoly. Up to this point there has not been a suggestion of a conspiracy.

Now we turn to the next paragraph, the twentieth. That paragraph alleges that by June, 1918,

the plans for the complete control and monopolization of this industry had developed to a point where the basic ingredients had been monopolized by a certain limited number of corporations, chief among them being the National Aniline and the others mentioned. So your Honor sees up to that point there is no charge of conspiracy. They are still talking about monopoly.

When we come to the next paragraph, the twenty-first paragraph, the allegation there is that a large proportion of the patents related to the dye industry. Nothing said there about either monopoly or conspiracy.

It is not until the following paragraph, the twenty-second, that we hear the first mention of a conspiracy, and it reads this way:

"That with the object and purpose of securing such control of said enemy-owned patents, copyrights, trade-marks, labels and other similar rights and applications therefor, and for the purposes hereinbefore stated, said persons, firms, corporations and trade associations"—no names mentioned at all—"and others associated with them in said industry * * * conceived and entered into a scheme, combination and conspiracy."

THE COURT: To do what?

MR. KRESEL: "Prior to or about November, 1918, to induce and procure the seizure of said enemy-owned patents, copyrights, trade-marks, labels, etc., and the sale, transfer and assignment thereof by said Alien Property Custodian to themselves or to some corporation, agency or institution controlled by them."

If we stop there to try to determine who the conspirators are, all that is vouchsafed to us is the statement that they were "said persons, firms,

corporations and trade associations." What is meant by that? Let us go back. Do they mean thereby the National Aniline and Chemical Company, and the Solvay process, and the Barrett and the duPont? Or do they mean the various persons, firms and corporations engaged in the production, manufacture and sale of dyes, which are mentioned in the eighteenth paragraph? Or do they mean both of them? That is the situation we have had to contend with—fighting atmosphere, fighting in the dark.

THE COURT: What was the paragraph to which you last called my attention, twenty-two?

MR. KRESEL: The last one, your Honor, is the twenty-second.

THE COURT: Will you tell me again what that is and what other charges of conspiracy are there in the bill?

MR. KRESEL: That is the only charge of a conspiracy. All subsequent charges are that pursuant to said conspiracy certain acts were done.

THE COURT: What is the conspiracy charged, as you understand it?

MR. KRESEL: As I understand it, it was a conspiracy to induce the seizure of the patents and to induce the sale and transfer thereof to the conspirators or to a corporation controlled by them. That is exactly as I stated it in my opening statement. Those, as I understand it, were the two purposes of the conspiracy. And Mr. Poucher is the gentleman who is named, and the only one that is named, as having been at the bottom of this alleged conspiracy representing this company. Now, if I am wrong, I welcome a correction from counsel.

MR. ANDERSON: At the proper time I will undertake to correct it, when I come to argue the

case. The only thing that is pending now is whether you can state a conclusion or whether you can state a fact.

THE COURT: That is the ultimate thing, Colonel Anderson. But that is not the basic thing.

MR. KRESEL: May the question be read, your Honor?

THE COURT: You may take the answer.

(Q. 86 repeated as follows: Did you have anything to do, directly or indirectly, with maintaining or continuing any monopoly in the dye industry in the United States?)

A. No.

MR. KRESEL: You may examine the witness; and you may examine him on any subject you want, whether I touched it on the direct or not.

MR. ANDERSON: You can stand aside, Mr. Poucher.

THE WITNESS: I beg your pardon.

MR. ANDERSON: There may be one question.

MR. KRESEL: He said he does not want to examine you.

MR. ANDERSON: Just a minute. There may be one question.

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 87. Mr. Poucher, you spoke of having filed with the so-called Shortridge Committee a statement showing the activities of the Dyes Institute?

A. Yes, sir.

XQ. 88. Will you see if this is the statement to which you refer (handing papers to witness)?

A. That is it.

MR. ANDERSON: We would like to offer in evidence the statement or schedule which the wit-

ness has identified, entitled "American Dyes Institute, Chronology from May 23, 1919, to December 31, 1921," introduced by Mr. Poucher as a part of his testimony before the so-called Shortridge Committee, to be found at pages 507-508,509-510 and 511 of the hearings before that Committee on Resolution 77. I will ask to have it marked, if it is admitted, and I will then furnish a copy later.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 657." (*See Exhibits, Vol. III, page 1635.*)

XQ. 89. I notice in your testimony before that committee you refer to Judge J. Harry Covington as counsel for the Dyes Institute. Was he one of the counsel that appeared for the Dyes Institute? I think it is in that testimony.

A. Yes.

XQ. 90. He appeared before the Federal Trade Commission, too, for them, did he not?

A. That I cannot answer. He appeared before the Ways and Means Committee.

XQ. 91. He is a lawyer in Washington, is he not?

A. He is a lawyer in Washington; yes, sir.

XQ. 92. Can you identify this letter and tell me who it is from, Mr. Poucher (handing witness paper)?

A. The signature does not seem to be here, but the initials I think I can identify as those of H. G. Stevenson.

XQ. 93. Who was H. G. Stevenson?

A. Manager of our New York office.

XQ. 94. When you say "our New York office," what do you refer to?

A. The duPont Company's New York office.

MR. KRESEL: Is there a question pending?

MR. ANDERSON: Yes, I am waiting for him to identify those letters.

THE WITNESS: I have done that. I answered your question, I think; did I not? You asked me who they were from and I said H. G. Stevenson.

XQ. 95. One is a letter from Mr. Stevenson addressed to Mr. Corwine. He was at that time Secretary of the American Dyes Institute, was he not?

A. I think so.

XQ. 96. The other is a letter from Mr. Stevenson addressed to you. It is unsigned; it is initialed at the bottom H. G. S.

A. Yes.

MR. ANDERSON: I offer in evidence the letter dated August 18, 1919, to Mr. W. R. Corwine, signed by H. G. Stevenson, which has been identified by the witness, and a letter dated the same date, addressed to Mr. M. R. Poucher, and initialed H. G. S., which the witness says are the initials of H. G. Stevenson. I ask that the first be marked Plaintiff's Exhibit No. 658, and, inasmuch as the second was an enclosure sent with it, that that be marked Plaintiff's Exhibit No. 658-A.

Received in evidence and marked respectively "Plaintiff's Exhibits Nos. 658 and 658-A." (*See Exhibits, Vol. III, pages 1645, 1646.*)

XQ. 97. Can you identify this letter, Mr. Poucher (handing witness paper)?

A. It is marked with my initials, so I assume it is mine, of course.

XQ. 98. It is a copy of a letter written by you?

A. Addressed to Mr. Howard.

XQ. 99. It is a copy of a letter written by you, isn't it?

A. I presume so. It has my initials on it, but it has not my signature.

XQ. 100. It is only a copy. Would you mind, if you identify it, putting your name on it?

A. If you will allow me to look it up I will make a note of it. If you will give me time to read it over, or you can mark it now if you would rather do that.

XQ. 101. Yes, certainly; read it.

A. I will initial this now. Is that what you want?

XQ. 102. Just put at the bottom of it your name or initial so that it will appear in the record as signed by you.

A. (Witness complies.)

XQ. 103. You also identify this letter dated March 3, 1919, addressed to Mr. C. Cyril Bennett (handing witness paper)?

A. I do.

XQ. 104. And is signed by you?

A. As shown.

MR. KRESEL: These are subject to our objection as to materiality and relevancy, your Honor.

THE COURT: All exhibits are, from each side.

MR. ANDERSON: I now offer in evidence a letter dated March 3, 1919, addressed to Mr. Henry Howard, signed by Mr. Poucher, which has been identified by him, and ask that it be marked Plaintiff's Exhibit No. 659.

THE COURT: Do you want to read it at this time?

MR. ANDERSON: I did not, sir. I do not care to take the time, unless your Honor desires it.

THE COURT: Does it bear on the issue of conspiracy?

MR. ANDERSON: Yes, sir; in my view it constitutes evidence connecting it up.

THE COURT: I should be glad to hear it, then, Colonel Anderson.

MR. ANDERSON: It connects up other evidence and other documents we have put in.

THE COURT: Then I should be glad to hear it.

Received in evidence and marked "Plaintiff's Exhibit No. 659." (*See Exhibits, Vol. III, page 1649.*)

MR. ANDERSON: The letter to which I have just referred, sir, is a letter addressed to Mr. Henry Howard and signed by Mr. Poucher.

(Reads Exhibit.)

The next letter is dated March 3, 1919, addressed to Mr. Bennett, Secretary of the American Dyes Institute.

MR. KRESEL: From whom?

MR. ANDERSON: From Mr. Poucher. I offer that in evidence and ask that it be marked Plaintiff's Exhibit No. 660.

Received in evidence and marked "Plaintiff's Exhibit No. 660" and read by Mr. Anderson to the Court. (*See Exhibits, Vol. III, page 1651.*)

XQ. 105. Who was Mr. Henry Howard and what was the association to which you refer in the letter I have just read, Mr. Poucher?

A. Mr. Howard was an officer in the Manufacturing Chemists Association. He himself was then connected with the Merrimac Manufacturing Company, of Boston, and is now with the Grasselli Company, of Cleveland.

MR. ANDERSON: I have no further questions to ask Mr. Poucher.

THE WITNESS: I am under subpœna of the Government, your Honor.

THE COURT: Are you through with Mr. Poucher on both sides?

MR. KRESEL: Yes, sir. The Government had subpœnaed him for the fourteenth day of June,

and he has been under subpœna ever since for the Government.

MR. ANDERSON: I did not know it. I am sorry and I apologize to you for it, Mr. Poucher.

He is released, as far as I am concerned, sir. I did not know he was under subpœna.

MR. KRESEL: The same with me.

THE COURT: You are discharged, Mr. Poucher.

(Witness excused.)

MR. KRESEL: At this time, your Honor, there are certain documents which I desire to put in evidence. First, I have received from Professor Stieglitz a request that I place before counsel for the Government and before your Honor certain corrections that he desires to make in his testimony. I have shown these four papers to Mr. Galloway, and I understand they are all right.

MR. ANDERSON: I have not had a chance to read them.

MR. KRESEL: If you would prefer to examine it a little later, Colonel, I will pass on to something else.

MR. ANDERSON: If you would, please. I intended to look at them during the luncheon, but did not reach them.

MR. KRESEL: And there is the letter that goes with them (handing counsel paper).

I offer in evidence a stipulation between the parties with reference to the so-called 10 (f) suits. Your Honor will recall that the Government put in the complaints in those suits brought by The Chemical Foundation. This stipulation is intended to cover the suits brought by the aliens for the same funds, and also by the Alien Property Custodian.

THE COURT: This is a stipulation?

MR. KRESEL: Yes, sir.

THE COURT: And it is intended to cover what?

MR. KRESEL: It is intended to show to the Court that, in addition to the suits for these monies brought by The Chemical Foundation, there are suits brought for the same monies by the alien enemies and by the Custodian. We have made a list of the various suits and have annexed hereto a sample of the complaint in each of the suits.

THE COURT: It may be filed.

MR. ANDERSON: As the stipulation provides that counsel shall have the right to object to the evidence as immaterial and irrelevant, and since that is expressed to be at the time it is introduced, I should like at this time to note that objection.

THE COURT: It may be noted.

Received in evidence and marked "Defendant's Exhibit No. 287." (*See Exhibits, Vol. V, page 3247.*)

MR. GALLOWAY: If your Honor please, the plaintiff at this time wishes to offer a stipulation concerning the 62 Bills of Complaint which have been filed here, which agrees upon a diminution of the record in that respect. It is signed by counsel on both sides and follows in sequence the stipulation which has just been filed.

Received in evidence and marked "Plaintiff's Exhibit No. 661." (*See Exhibits, Vol. I, page 683.*)

MR. KRESEL: I now offer in evidence the minutes of the American Dyes Institute of January 8, 1919; your Honor will recall that the Gov-

ernment put in a great many of the minutes of this American Dyes Institute and, while we consider the whole thing immaterial, in view of the fact that some are in the explanation contained in these minutes is absolutely necessary.

MR. ANDERSON: I have no objection, sir. I thought they were all in.

Received in evidence and marked "Defendant's Exhibit No. 288." (*See Exhibits, Vol. V, page 3296.*)

MR. KRESEL: We offer in evidence the minutes of the American Dyes Institute meeting held on April 4, 1919.

Received in evidence and marked "Defendant's Exhibit No. 289." (*See Exhibits, Vol. V, page 3300.*)

MR. KRESEL: We offer in evidence the minutes of a joint meeting of the Board of Gevernors and the Executive Committee of the American Dyes Institute, held April 8, 1920.

Received in evidence and marked "Defendant's Exhibit No. 290." (*See Exhibits, Vol. V, page 3308.*)

MR. KRESEL: We offer in evidence the minutes of a meeting of American Dyes Institute, held on April 12, 1920.

Received in evidence and marked "Defendant's Exhibit No. 291." (*See Exhibits, Vol. V, page 3313.*)

MR. KRESEL: I offer in evidence the amended constitution and by-laws of the American Dyes Institute. The Government put in the original set of the constitution and by-laws. These have since been very materially amended, and were so amended prior to 1919.

MR. ANDERSON: Does it appear on their face

when they were amended? Because otherwise I should object to them.

MR. KRESEL: No, there is nothing. I do not find any date thereon.

MR. ANDERSON: Are those in the minutes? Do the minutes identify the amendments?

MR. KRESEL: Some of the amendments contained in these by-laws are referred to in the minutes.

MR. ANDERSON: I would not object to the marking if it appears by the minutes that the amendments were made and what the amendments were; the minutes are introduced and they speak for themselves. But I have no way of identifying this copy, its correctness or when it was made, and I will have to ask that the original minutes be introduced and be properly identified.

MR. KRESEL: In the minutes of the meeting of January 8, 1919, which have just been marked as Defendant's Exhibit No. 288, there is found this statement:

"Amendments and changes in by-laws and constitution read and approved."

That is January, 1919. The minutes do not show what the amendments were.

MR. ANDERSON: Then I could not accept the statement that these were adopted.

THE COURT: In order to make the book admissible, would it not be necessary to have a witness identify the by-laws therein referred to?

MR. KRESEL: Certainly, if counsel objects.

MR. ANDERSON: I have never seen the book.

THE COURT: The objection, I think, is well taken, Colonel Anderson.

MR. KRESEL: If your Honor please, upon stip-

ulation of counsel I now offer to read and shall not read, because it would take too long, the statement of Harry E. Danner, treasurer of the American Dyes Institute, made before the subcommittee of the Committee on the Judiciary of the United States Senate on Senate Resolution No. 77, which appears printed at pages 491 to 499 of the proceedings before that committee, with the exception, however, of one sentence which appears at page 497 of this record, which I have marked in parenthesis, that is to be omitted.

THE COURT: Is this book in evidence?

MR. KRESEL: No, your Honor.

THE COURT: The book can be given a specific number, which will apply only to the pages indicated.

MR. ANDERSON: I wish to state in regard to that, if your Honor please, in order to save bringing Mr. Danner back, I stipulate that he would testify as therein stated. I do not stipulate the evidence, of course. I merely stipulate that he would go on the stand and testify to that evidence.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 292." (*See Exhibits, Vol. V, page 3327.*)

MR. KRESEL: I offer in evidence assignment by the Alien Property Custodian to the American Radio Company of three certain letters patent described in this assignment, the instrument being dated the twentieth day of November, 1919. I think your Honor might properly inquire as to the relevancy of that. It is this: They have to do with the wireless stations that were seized by the Government. There was a corporation called The American Radio Company, which controlled

the patents for the Government; and at the request of the Government, the Alien Property Custodian conveyed these three patents to The American Radio Company. This is to fill out the series of assignments to the Government that I have hitherto put in.

MR. ANDERSON: In addition to the general objection, I make the further objection to this document that it appears to be between the Alien Property Custodian and The American Radio Company, and I do not see that it has any bearing upon the issues.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 293." (*See Exhibits, Vol. V, page 3347.*)

MR. KRESEL: I offer in evidence an assignment signed by F. D. Roosevelt, Acting Secretary of the Navy reassigning to the Alien Property Custodian of three certain patents also relating to the wireless system. This is dated November 11, 1919.

MR. ANDERSON: This document is subject to the general objection. I haven't any specific objection.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 294." (*See Exhibits, Vol. V, page 2801.*)

MR. KRESEL: I offer a memorandum taken from the files of the Alien Property Custodian in reference to the reassignment by the Navy Department to the Alien Property Custodian of the three patents, which reassignment is so marked Defendant's Exhibit 294.

MR. ANDERSON: If your Honor please, I take it, of course, that the statement of counsel on the

record as to these papers has no bearing. It is simply his description as he understands it. I do not agree with him on his interpretation of those papers, and I would not like that to be accepted.

THE COURT: I assume it was for the purpose of identifying it on the record.

MR. ANDERSON: As to this memorandum from the Alien Property Custodian's office, or said to be from the Alien Property Custodian's office, I do not recall having ever seen it or heard of it. It is not signed by anybody.

MR. KRESEL: That memorandum is a memorandum which came, Colonel Anderson, with these stiff gray folders which were brought in here from the Alien Property Custodian's office. Do you remember that, Mr. Galloway?

MR. GALLOWAY: No, I do not.

MR. KRESEL: I will withhold that until it is identified by Mr. Skinner.

I now desire to read to your Honor the testimony of Brigadier-General Amos A. Fries, which, by stipulation, is being read as if the witness had been sworn here. The stipulation is that if sworn, he would have given this testimony.

THE COURT: Exhibits of that character should come more properly in your testimony record than in your exhibit book, should they not?

MR. KRESEL: I think so, your Honor. Therefore, I am reading it. It is not very long.

THE COURT: It can be copied right in.

MR. KRESEL: I consider it important. This is found in the Hearings before the Committee on Finance, United States Senate, on the proposed Tariff Act of 1921, H. R. 7456, beginning at page 374.

MR. ANDERSON: On behalf of the Government we have stipulated, in order to avoid calling General Fries, who desired to go West, that we would consent that this evidence might be read subject to any objections that might be made to his testimony if he so testified upon the witness-stand.

THE COURT: With the same force and effect as if the testimony had been given in court?

MR. ANDERSON: As if it were given here; and that exceptions might be taken to adverse rulings.

MR. KRESEL: (Reading.)

"GEN. FRIES: Mr. Chairman and other members of the Senate Finance Committee, I have here a chart that was drawn up about a year ago——

"SENATOR WATSON. Give your name, please, and your experience in this matter.

"GEN. FRIES. Amos A. Fries, Brigadier-General, chief of the Chemical Warfare Service.

"SENATOR WATSON. When did you become chief of the Chemical Warfare Service?

GEN. FRIES. I became chief of the Chemical Warfare Service in France on or about August 17, 1917, and continued as chief of the service in France throughout the war.

"SENATOR WATSON. Chief of the Chemical Service in France throughout the entire war?

"GEN. FRIES. Yes, sir; returning to the United States just before Christmas in 1918.

"SENATOR WATSON. What have you been doing since?

"GEN. FRIES. I have been on duty with the Chemical Warfare Service; partly in Washington and partly in command of Edgewood Arsenal, and, since March 1, 1920, chief of the Chemical Warfare Service of the United States Army.

"SENATOR WATSON. When was the Chemical Warfare Service established in connection with the Army?

"GEN. FRIES. It was established in France

definitely on September 3, 1917. I was put in charge a couple of weeks before that.

"SENATOR WATSON. And before that there had been no such thing in connection with the American Army, had there?

"GEN. FRIES. There had not.

"As I started to say before, I have a chart here which was drawn up a year ago to show the relations between war gas and dyes, explosives, and pharmaceuticals or medicines. It was drawn up for an exhibit in New York City, but serves admirably the purpose of illustrating why the War Department is interested in the coal-tar industry.

"As you know, from coking coal or making illuminating gas you get coal tar, and you distill that and get these crudes of which we give only five here, there being five others.

"SENATOR DILLINGHAM. General, I suggest that your chart will not appear in the record.

"SENATOR WATSON. Name them, please.

"GEN. FRIES. Benzene, toluene, xylene, phenol, naphthalene, and five others. These are put on here because they show clearly what are essential, and the others were omitted because they would have complicated the chart.

"All of our war high explosives, most of our war gases, many of our most important medicines, and our photographic chemicals, all of which are essential in war, come either directly from these coal-tar crudes or in combination with other chemicals. For instance, tri-nitrotoluol, which is the only explosive now used in war by any nation, so far as they have a sufficient quantity of it. Before that it was all picric acid, or some compound of it, which comes from phenol by nitrating.

"We have shown here how these crudes are made into dyes. Toluene is made into dyes and made into high explosives, and the picric acid in the same way and into medicines also. We have shown only one group here, acetanilid; but

there are a number of groups coming from benzene and aniline dyes, also from carbolic acid.

"We make chloropicrin directly from the bleach, itself made from chlorine, and picric acid, and it is one of the most important war gases that we have.

"Phosgene is another one of our most important war gases. The Germans learned how to make it and use it. They knew how to make it, because they used it directly in making dyes, and it is so used in this country now. We have sold a good deal of our surplus phosgene to dye makers.

"In that connection, the first phosgene that was made here was made in a chemical plant at Niagara Falls. They had about the only information outside of Frank Hemmingway, who was engaged in chemical production in New Jersey.

"SENATOR SMOOT. To whom do you refer when you say 'we'?

"GEN FRIES. The Chemical Warfare Service.

"SENATOR SMOOT. The Chemical Warfare Service got up this diagram?

"GEN. FRIES. Yes, sir.

"SENATOR SMOOT. From what Germany was already doing?

"GEN. FRIES. Well, from what Germany was doing and also what we had done, and to show, also, what we were going to have to do in the future if we keep prepared on this question.

"From the phosgene dyes were made such as yellows, violets, blues, and in that way, while it was not a coal-tar product, it entered right into the manufacture of dyes.

"We are interested in the medicine side of this question tremendously, and in photographic chemicals as well as the dyes; but the dyes are the most important in a commercial way. Hence, if that is kept up the others rather follow. In fact, the development of the medicinal parts of these coal-tar products followed the development of dyes, even in Germany. Before the war, according to the Tariff Commission's report of

1915, there were only seven concerns engaged in making dyes in this country. In the 1920 report, after six years of total embargo, there are shown 82.

"SENATOR CURTIS. Right there: The seven to which you refer were making a very limited number of dyes?

"GEN. FRIES. A very limited number; and they were using a great deal of intermediates, which are the next step after the crudes, and even crudes imported from Germany. We had a very small coal-tar industry, although we had millions of pounds going to waste in the old-fashioned coke ovens.

"When the war came on the United States could not get enough high explosives from toluene. It could not manufacture any war gases, scarcely, until it began to build its own plants. The Chemical Warfare Service started in with the hope of getting the chemical plants to make those war gases. Their plants were not large enough. They were already overburdened with war orders, and notwithstanding that they had been increasing some of their facilities for the two years that they had been working for the allies on some of those things, the Government had to build tremendous factories throughout the country. Even then, as I said before, some of our very first phosgene was made in chemical works at Niagara Falls, and another at Bound Brook, N. J., the Frank Hemmingway Co. The chloropicrin was manufactured in a concern at I wished to be sure not to fall into a second one. made some of our first mustard gas, but even in Stamford, Conn., while the Dow Chemical Works those cases the Government had to help build additional plants in those places. Those plants not being able to meet the needs, the Government started in and built some other plants, notably one at Edgewood Arsenal, which we now have in condition for use, at a cost of $35,000,000, and several others costing many, many millions more. At the same time, the Ordnance Depart-

ment built tremendous plants.

"SENATOR WATSON. Where is that $35,000,000 plant?

"GEN. FRIES. Twenty miles beyond Baltimore, on the Pennsylvania Railroad.

"SENATOR WATSON. Is it still operating?

"GEN. FRIES. We are operating the research part of it, which is the only thing we can operate.

"SENATOR SMOOT. You cannot dispose of your products, and the Government does not want them today?

"GEN. FRIES. We could make a lot of products which we could dispose of, but it is not the Government's intention to engage in business. We could make chlorine and bleach and even phosgene for sale.

"SENATOR CALDER. Is it the War Department's desire to maintain and retain that plant?

"GEN. FRIES. It is, until such time as we have so completely developed the coal-tar industry that we can afford to abandon it. As a matter of fact, today we would have to depend on that plant for a large part of our war gases, because we have not the plants throughout the country and the trained personnel to do it. Even now, if we started those plants, we would have to call on the coal-tar industry and other chemical industries for probably three or four or five hundred chemists and chemical workers and chemical operators to put that plant into operation.

"SENATOR WATSON. How many expert chemists have you now in connection with the Chemical Warfare Service?

"GEN. FRIES. We have about 150 or 160, but they are almost entirely on research and development. We are doing those things which we cannot get any college or research institutions to do. There are certain researches and developments in connection with poisonous gases that the college and other institutions do not want to take up.

"SENATOR SMOOT. Do I understand that the Government made these researches and provided the data so that the necessary war materials could be manufactured in this country?

"GEN. FRIES. A considerable part of them. We sent a good deal of it over from France. We had very little information here. One of the most important duties I had as chief of the Chemical Warfare Service in France in the early days was to get this information and transmit it over by officers and men, which we did in many cases, or by letter, to the United States. They got much additional information on phosgene in addition to that which they got in the Oldbury Chemical Works and the Frank Hemmingway Chemical Works.

"SENATOR SMOOT. Did the information come here through the Government?

"GEN. FRIES. Not all of it. Part of our information on the manufacture of chloropicrin came from private parties; and as to the phosgene part of it, the very first that we got came from the Oldbury Chemical Works, at Niagara Falls. Mr. Lidbury, in particular, took an interest in it, and also Frank Hemmingway, at Bound Brook, N. J. The Government added to it just as soon as we could get the information, because it was not in existence in this country in sufficient amount to do the work.

"We were also short, in France, of personnel. We could not get trained chemists, enough for field use. We have a great deal of use for chemists right out in the field.

"One instance illustrates that clearly. In the fight in which the marines were engaged at Belleau Woods a report came back to corps headquarters that the Germans were using a new gas and they did not know just what to do. One of the ablest men I had, a chemist, was sent there and rushed into the thickest of the fight, clear through the area, and was able to report to them that it was no new gas; that it was the same gas

they had been using, and that our gas masks were a protection against it.

"That information was of very great importance to that command and the whole division operating around there. We will need more men of that kind in a future war. We could not get enough of them in France.

"SENATOR WATSON. How many poisonous gases did you send abroad during the war that were made in America?

"GEN. FRIES. We sent out four or five. Of course, chlorine was sent abroad. It was used as a poisonous gas in cloud gas, but now it is not really considered a poisonous gas, being much less poisonous than many others. We sent abroad some mustard gas, a great deal of chloropicrin and a great deal of phosgene.

"SENATOR WATSON. Had any of those been made in the United States before the war?

"GEN. FRIES. Not at all. There was a little experimental work in the laboratories with phosgene.

"SENATOR LA FOLLETTE. To what extent had it been made outside of this country before the war?

"GEN. FRIES. Phosgene had been made to a considerable extent in Germany.

"SENATOR LA FOLLETTE. How about the others that you named?

"GEN. FRIES. I do not think chloropicrin had been made to any extent at all. Mustard gas had not.

"It is interesting in connection with the dye question to note that the Germans used one of the ingredients that they finally made mustard gas from in photographic chemical work, allied with the coal-tar products, and were able to make mustard gas rather quickly, after they decided to make it, by a method which had been known since 1886. We could not make it by that method, and never did, because we had not developed that part of our photographic or coal-tar industry. So we had to introduce an entirely new method

developed chemically by Prof. William A. Pope, of England, and by the Usine du Rhone, a dye plant in France, where it was first worked up. It was later perfected by Levenstein, a dye manufacturer of England. The process that we are now using is practically the latter's.

"The result was that through our not having that information, which the Germans had in making these products for dyes and photographic chemicals, it was eleven and a half months after the Germans began using mustard gas before we could fire any back at them. It is probable that had we had this industry developed we would have saved several months and a good many lives.

"SENATOR SMOOT. Germany is not making any of those gases at the present time, is she?

"GEN. FRIES. Presumably not; unless, perhaps, she is making phosgene for dyes.

"SENATOR SMOOT. That would be the only thing.

"GEN. FRIES. And also chloropicrin is used to some extent directly in making dyes, and she can make some of that.

"SENATOR SMOOT. But there is very little demand for it in the world today, is there not?

"GEN. FRIES. Comparatively little.

"SENATOR SMOOT. Of course, you will not make any until there is a demand?

"GEN. FRIES. No, sir. But every one of these plants that are making dyes or medicines or photographic chemicals or perfumes or any of these other products that come from coal-tar can be turned, in a few weeks, into explosive plants. If we have not those plants, then we have got to build huge plants such as we built during the war; and in the next war we will not have time for it.

"SENATOR WATSON. Germany, before the war, had made explosives.

"GEN. FRIES. Extensively.

"SENATOR WATSON. And they were all a product of the dye industry?

"GEN. FRIES. Yes, sir.

"SENATOR SMOOT. They made the same ex-

plosives that we made in this country, did they not?

"GEN. FRIES. We made more dynamite from nitroglycerine than anything else, and we made very little trinitrotoluol because we had not the by-product to make it from. We went so far during the war, in order to get this toluene, as to rob the illuminating gases of New York City, to a very great extent, to get enough toluene to make the trinitrotoluol. Before that most of the countries were using picric acid or some picric-acid compound. For instance, that was the explosive dunnite of the United States, the lyddite of England, the mellinite of France, and the shimose of the Japanese.

"We are interested because we believe that without a complete development of the coal-tar industry we cannot be nationally prepared in case we have to be, and we will not have time in the future to build a great plant such as the one at Edgewood. Even if we keep that up we are going to have to depend upon these industries for the trained personnel to operate with. We could operate now in forty-eight hours if we could get the trained men, but we have got to draw them from these other sources.

"We have felt that the embargo was a success during the war, in building up this industry from, say, 7 plants to 82, and that if it had done that during this time, the embargo, continued for some time, would eventually develop our industry to the point where we would be making practically all the dyes that Germany is making, and we would be utilizing all of the coal-tar products. In other words, before they do that they have got to change over many beehive coke ovens to those that will save the coal tar.

"SENATOR SMOOT. General, if the industry can be protected by a rate of duty, you have no love for the embargo, have you?

"GEN. FRIES. Not at all.

"SENATOR SMOOT. All you want, you say, is that the coal-tar products from which ex-

plosives and the necessities in the United States are made in case we get into another war have sufficient protection to enable the amount to be made that the Government would require?

"GEN. FRIES. Yes, sir. But looking at it from the result before the war, when we had a duty on dyes and when we had made practically no progress, and looking at the progress we made under the six or seven years embargo due to the war, which was a total embargo, it would seem the part of wisdom, to me, to continue that embargo long enough to develop the other 40 per cent. of these coal-tar products and the other 500 or 600 dyes that are not made in this country.

"SENATOR SMOOT. You know that the rate of duty was rather low on dyes; that is, the rate was put upon the dyes in the Underwood bill according to the request made by the dye manufacturers of the United States. At that time they had no idea or thought of making explosives for the Government of the United States. That came about on account of the war. But there is no question in my mind—there may be in the mind of others—that 90 per cent. of all of these can be protected by a rate of duty; and I am perfectly willing to give them a rate of duty, but am opposed to any embargo.

"GEN. FRIES. So far as I have been able to investigate it and talk with those I thought well informed, I do not see how a duty, unless it were a hundred per cent. of the American cost, would keep them out.

"SENATOR SMOOT. I would rather do that than have an embargo." * * *

"SENATOR WATSON. And as they developed the dye on one side by adding a little of some chemical, or by taking away a little of some chemical, they could make an explosive, and over on the other side they could make a medicine?

"GEN. FRIES. Yes, sir.

"SENATOR WATSON. So that nearly all of these coal-tar medicines came from research work in the German industries.

"GEN. FRIES. Yes, sir; and mustard gas came into being in just that way, because Victor Meyer, in 1886, discovered mustard gas and worked with it until he found it produced these burns that were produced during the war, and he had to quit working with it. It was undoubtedly at the same period of time that the investigation I spoke of awhile ago, beginning in the seventies, that Germany discovered mustard gas and a number of other compounds as well as most of the gases employed toward the end of the war.

"THE CHAIRMAN. What were you quoting from, General?

"GEN. FRIES. I am quoting from the Report of the British Mission Appointed to Visit Enemy Chemical Factories in the Occupied Zone Engaged in the Production of Munitions of War.

"SENATOR SMOOT. General, you put the whole of it in.

"SENATOR WATSON. Yes; do not read it all, but put it in.

"THE CHAIRMAN. How long is it?

"SENATOR SMOOT. It would be best to have it all in."

THE COURT: When was that report or testimony given?

MR. KRESEL: This testimony, sir, was given August 3, 1921.

I offer in evidence a letter from Honorable John W. Weeks, Secretary of War, dated August 15, 1922, directed to the Chairman of the United States Senate Finance Committee, which is printed in the Congressional Record under date of August 17, 1922, at page 12,540. I may say, your Honor, that this is a letter from Secretary Weeks, with reference to the bill then pending before Congress with reference to the dye industry, in which the Secretary points out the importance of the industry as a national defense.

MR. ANDERSON: I object on the ground first that it is immaterial and irrelevant; and on the second ground that it is a letter written in 1922, about the time, I think, this bill was filed——

MR. KRESEL: So much the better.

any bearing upon the transactions affected in the bill; and in the second place, being subsequent to the letter of the President upon which this bill is based, it is further immaterial and irrelevant.

THE COURT: I will hear you, Mr. Kresel.

MR. KRESEL: I will say, if your Honor please, first, that I desire to proceed, after offering this letter, to offer a letter from the President himself upon the same subject, and also a letter from Secretary Denby of the Navy; but quite aside from that, the fact that this letter is dated subsequent to the President's letter, in my humble judgment, it does not deprive this letter of probative value. As your Honor has several times stated, one of the questions that the Court has got to decide is whether the President, in the exercise of his duties and the discretion vested in him by Congress, had a right to take into consideration the disposition of this property, that it had a relation to the national safety.

Now, though it is true that that question was determined by the Executive in 1919, the relation of the dye industry to national safety has by no means been changed from that day to this. This is evidence that we offer, of men best fitted to know the importance of the dye industry in the matter of national defense. It is as true today as it was true early in 1919, when this transaction was put through. It certainly cannot be said that if I call General Pershing on the witness stand here today that the Government could be

heard to say that his testimony as to the importance of the development of the dye industry in its relation to national defense is immaterial, because he is giving the testimony today and not in 1919; and I propose to offer a letter from General Pershing upon this very question, written by him to Congress, when Congress was determining whether or not to protect this dye industry, in order that it might be the basis of national defense.

MR. ANDERSON: I am willing to concede that the views of General Pershing and the Secretary of War, and all other competent persons advising Congresss as to its policy and the exercise of its legislative discretion, may be very important. They are the natural sources of information for Congress. The sole question as I understand it, before this Court, is a question of law, upon the facts in this case, and whether it be a wise policy or an unwise policy, as I understand it, is not a question for the consideration of this Court. Therefore, what might be very pertinent to Congress has absolutely no relation here, but is improper for consideration here. Believing that to be true and as fundamental as the form of our Government itself, and as elementary as the alphabet, I object to the evidence, not because I question in the slightest that the dye industry is important commercially, and may, if the emergency should arise, like every other industry, become important as a part of the national defense and of the national military activity if that occasion should arise, as also the steel industry and all others, and I do not question its importance, nor does the Government stand here to question the importance of this industry from any standpoint, no matter what it is, either the dye or

chemical or any other from the standpoint of military defense, or anything else, but it is very important that in a lawsuit to say that there are certain rules of evidence and law which control the action of the Court; and my contention is that this matter cannot be brought within those rules.

MR. KRESEL: In other words, the Government comes in to vindicate the rights of the Germans upon a claim that their property has been confiscated; and the Government says that it is not interested in this case with the proposition that that property was vital for the safety of this country and that it will estop us from proving that fact to the Court.

MR. ANDERSON: No, sir. The Government does not come here to vindicate the rights of the Germans. It is not interested in the rights of the Germans except to the extent of its duties under International Law. It is profoundly interested in the duties and the obligations, legal and moral, of the United States, and therefore, conceiving those duties to require its action, those who are charged with the duty of deciding that question have decided it. Except as stated, they have no interest whatever in the Germans one way or the other, but they have a profound interest in the obligations, legal, moral and international of the United States.

In the second place, the Government of the United States has not in this proceeding and does not propose in this proceeding to undertake to prevent the defendant or any one else who is charged with that duty or has that right in this court from proving any fact in a legal manner which has any bearing upon the issues in this case. But it does propose, as a part of its duty,

in not only protecting the rights committed to its care as it sees them, but in the administration of the law, to insist to the best of its ability, or at least to submit to this Court for its consideration—I would not use the word "insist"—that the issue be tried under the rules of law and evidence which control the operation of a law suit. That is the position of the Government.

THE COURT: I follow you, Colonel Anderson. My difficulty is this. I have doubts as to whether it is proper testimony to be taken into consideration by me in determining the issues of this case. It is a question for me to determine hereafter, as best I can, whether those issuing orders in 1918 and 1919 were or were not authorized to consider the military value of the chemical plants in authorizing the private sale of these properties for a specified sum. That is one of the difficulties. Do these communications from such officers as General Pershing and Secretary of War Weeks to the President of the United States come under your stipulation?

MR. ANDERSON: They do not come under the stipulation, but we will not raise the question of their authenticity.

THE COURT: As I understand you, Colonel Anderson, if the Government were to concede that military value was one of the questions that would have to be determined, you contend this is not proper evidence to be received in that determination, as I understand you. Am I right?

MR. ANDERSON: You are right in both; that the military value and the economic value, while matters of profound importance in a proper forum, were not to be considered by the Alien Property Custodian; and second that they are not evidence in any event.

THE COURT: There is no documentary evidence offered by you that was rejected. They were all admitted under the General Rule. Is that not true?

MR. ANDERSON: I think that is probably true, sir.

MR. KRESEL: Why qualify it. Is it not all true?

MR. ANDERSON: I think it is probably true, as far as I can recall. If you ask me for an absolute answer, I say to you that I do not know what is in this record. I cannot recall the details of several weeks.

MR. KRESEL: You can recall whether anything has been rejected.

MR. ANDERSON: As far as I recall, it has not.

THE COURT: My recollection, Colonel Anderson, is quite clear that I permitted you to put in every document you offered, aggregating something over 600 exhibits, without considering whether they had any evidential value or not.

MR. ANDERSON: I understand that, sir. I merely wanted to put on the record my special objections to this particular evidence.

Received in evidence and marked "Defendant's Exhibit No. 295." (*See Exhibits, Vol. V, page 3350.*)

(Defendant's Exhibit No. 295 read by Mr. Kresel.)

MR. ANDERSON: In order to prevent the necessity for reading a lot of that record further, is it not a fact that that was the bill which Congress refused to pass, and that subsequently they did put a sixty per cent. duty on the American valuation?

MR. KRESEL: No. By the way, all of that is

somewhat confused now, and I propose in a few minutes to put in a statement of just what the legislation was. I think I have it here now—just what legislation there was to protect this industry.

MR. ANDERSON: Whose statement are you going to put in?

MR. KRESEL: I am going to put in a statement drawn from the records. If you do not agree with it you may correct it; or I will give it to you now and you may check it up.

MR. ANDERSON: I think I would have to check it up before I could let it go into the record.

MR. KRESEL: I thought you would. All right, I will give it to you and you can check it.

MR. ANDERSON: I will check it and see if that is a statement of the legislative procedure.

MR. KRESEL: I offer now a letter from President Harding to Hon. Nicholas Longworth, House of Representatives, dated August 10, 1921, printed in the Congressional Record of August 11th, 1921, at page 4899.

MR. ANDERSON: The same objection.

MR. KRESEL: It is short, your Honor, and I will read it into the record:

"THE WHITE HOUSE

"Washington, August 10, 1921.

"HON. NICHOLAS LONGWORTH,

"House of Representatives, Washington, D. C.

"My dear Congressman Longworth:

"I have your note calling my attention to the fact that the bill extending the provisions of the emergency tariff act relating to the protection of the American dye and chemical industry is to be before the House on the morrow. I am aware that the Secretary of the Treasury has already called the attention of your committee to the extreme desirability of extending this protective provision.

"Surely we would be both unmindful and unjust if we failed in a suitable protection of this

industry until the new and complete tariff revision act is made effective.

"Very sincerely,
(Signed) WARREN G. HARDING."

MR. ANDERSON: I will withdraw my objection to that letter.

MR. KRESEL: I now offer in evidence a letter from John J. Pershing, dated July 15th, 1921, printed in the Congressional Record the 16th of July, 1921, at page 4087. I shall read it into the record:

"GENERAL OF THE ARMIES,
"Washington, July 15, 1921.

"HON. NICHOLAS LONGWORTH,
"House of Representatives, Washington, D. C.

"Dear Mr. Longworth:

"With reference to the protection for the dye industry in this country, it can be stated that the coal tar products of which these are the most important at present in peace, are the basis of practically all of our high explosives and most of our war gases. Our shortage of chemical plants in general and dye plants in particular prior to the World War made it difficult for us to obtain a supply of high explosives and gases until we had been in the war for several months. From the above the importance of the chemical industry from a military standpoint will be readily seen.

"Sincerely yours,
JOHN J. PERSHING."

MR. KRESEL: There is one more, your Honor. I offer in evidence a letter from Hon. Edwin Denby, the Secretary of the Navy to Honorable Bois Penrose of the United States Senate, dated July 27th, 1921. This I understand is under our stipulation.

Received in evidence and marked "Defendant's Exhibit No. 296." (*See Exhibits, Vol. V, page 3352.*)

MR. KRESEL: I now offer in evidence the report of the Ways and Means Committee of the House of Representatives on bill H. R. 7456, dealing with the protection of the dye industry; this report having been made July 6, 1921. I want to say here that the portions of the report that I offer are those ending with the first paragraph on page 9. If counsel for the Government desire the whole report in, I have no objection.

MR. ANDERSON: What does the balance relate to?

MR. KRESEL: The balance relates to different schedules of the Tariff Bill, which have no relation to this, and I do not want to encumber the record.

MR. ANDERSON: I want, in addition to the general objections heretofore made, to note the objections that I have made to the introduction of reports of Congressional committees.

THE COURT: Is that what this is?

MR. ANDERSON: That is what this is; a report of a Congressional Committee. Of what date, Mr. Kresel?

MR. KRESEL: 1921.

MR. ANDERSON: 1921. And I do not think it is necessary to renew those objections in detail.

MR. KRESEL: Your Honor passed on that objection at the time I offered the report of Congressman Longworth on another bill.

Received in evidence and marked "Defendant's Exhibit No. 297." (*See Exhibits, Vol. V, page 3353.*)

MR. KRESEL: I offer in evidence copy of a letter signed jointly by The Chemical Foundation, Incorporated, and the Grasselli Chemical Company, directed to the State Department which bears reference to Plaintiff's Exhibit No. 601.

If counsel requires any explanation of this exhibit, I shall say this: There is evidence in the case with reference to royalties collected by The Chemical Foundation on the Reparation dyes. I think your Honor will recall that some point was made of that. This letter is an explanation of the arrangement that was made with the State Department resulting in those collections.

In substance it was this: These dyes were coming in here and the industry took the position that the dyes should not be thrown onto the market here in competition with production in the United States, unless the competition was reasonable and fair. Therefore, the State Department said that they would let these dyes go in provided they would be subject to the same duty or license fee as any other importations, so that they would stand on an equal footing with production in the United States. That was put in the form of a letter and that is the letter that I offer now.

MR. ANDERSON: That letter is not addressed to anybody. I do not know anything about it. Where did it come from?

MR. KRESEL: That letter comes, Mr. Boggs, from the files of the State Department?

MR. BOGGS: It does.

MR. KRESEL: Comes from the files of the State Department?

MR. ANDERSON: That is the first I have heard of it. If Mr. Boggs tells me it comes from the files of the State Department, I will waive proof as to its authenticity. But I do not know to whom it is addressed.

MR. BOGGS: Mr. Keohan tells me he got it from the War Trade Board Section.

MR. KRESEL: War Trade Board Section of the State Department.

MR. ANDERSON: It may go in subject to verification——

MR. KRESEL: You may make inquiry as to that.

MR. ANDERSON: And reserving all other objections.

Received in evidence and marked "Defendant's Exhibit No. 298." (*See Exhibits, Vol. V, page 3367.*)

MR. KRESEL: Mr. Galloway, we asked for the production of the report of Colonel Joyes made to the War Department. Is that now available?

MR. GALLOWAY: It is not available.

MR. KRESEL: May it be understood, your Honor, that when it is available, we may put it in. The Government is trying to get it for us.

THE COURT: Yes.

MR. KRESEL: I shall mark it on my list "reserved".

Now, we asked for some cablegrams from the State Department. Have those been produced?

MR. GALLOWAY: Yes, I have those at the hotel. I haven't them here. I have had them copied.

MR. KRESEL: Will your Honor permit me to hold that open. I will reserve that.

THE COURT: Yes.

MR. KRESEL: How about the report of Major Sill?

MR. GALLOWAY: That was only requested yesterday, and I have not got it.

MR. KRESEL: May I reserve that, your Honor?

MR. ANDERSON: What was that?

THE COURT: Report of Inter-Allied Commission inspecting the gas plants of Germany?

MR. KRESEL: Yes, your Honor.

I have already stated, your Honor, that our translation of the French document was not complete, and I understand that I have the right to make a translation of the plans, submitted to the other side, and if correct, it will go in.

I offer in evidence Executive Order No. 3764, made by President Harding, and Signed December 11, 1922, covering private sale by the Alien Property Custodian of 989 shares of the common capital stock of the Busch-Sulzer Brothers Diesel Engine Company, and in that connection I offer in evidence the first paragraph on page 56 of the Annual Report of the Alien Property Custodian for the year 1922, which deals with this private sale.

I may say here, your Honor, that the only purpose for which I am offering this Executive Order is that of indicating the form and the specification of reasons actuating the executive in making the Executive Order, my purpose being to indicate that they are almost word for word the form that is being attacked here by counsel for the Government as insufficient.

Mr. Anderson: I shall not object, in view of the statement of counsel. I do not see that it has the slightest bearing; but in view of the fact that it is an order of the President of the United States, and the statement of counsel, I am not going to make any objection to it whether as to relevancy or anything else.

The Court: You mean it has evidential value?

Mr. Anderson: Not the slightest; I do not think it has a thing to do with it. But if counsel wants it to go in and can make any argument upon it whatever—I am not making the objection be-

cause I do not want to have another argument about the Government trying to suppress something.

MR. KRESEL: If we have gotten to that point I have done well today.

MR. ANDERSON: Yes, I have gotten tired of it.

Received in evidence and marked "Defendant's Exhibit No. 299." (*See Exhibits, Vol. V, page 3368.*)

MR. KRESEL: Permit me to read the three reasons that are assigned here. (Reads from Defendant's Exhibit No. 299.)

MR. ANDERSON: If your Honor please, I do object to putting on the record in this case an argument on this order. If they insist on arguing it, I shall object to its going in.

MR. KRESEL: Then I will not argue it.

I read from the first paragraph, page 56, of the Annual Report of the Alien Property Custodian, for the year 1920, as follows:

"Sales other than real estate: (1) 990 shares of Busch-Sulzer Brothers Diesel Engine Company stock was sold to C. Drummond Jones of St. Louis, Missouri, on December 29th, 1922 at $40 per share, under authority given in Executive Order 5,990, dated December 11th, 1922, for which the sum of $39,600 was received."

MR. ANDERSON: Subject to my general objection.

MR. KRESEL: The first statement of Professor Stieglitz that I am about to call to your Honor's attention refers to testimony in open Court. May I read it on the record, your Honor:

"My delay in answering the question of Colonel Anderson as to the revealing of information as to processes to defendant's counsel was due to my uncertainty as to whether in law the letters al-

ready put in evidence would be considered as a revelation. Assured in regard to the legal question in my mind, I was prepared to answer 'No.' Having unconsciously fallen into one legal pitfall, I wish to be sure not to fall into a second one.

(Signed:) JULIUS STIEGLITZ.

Chicago, July 16th, 1923."

MR. ANDERSON: Of course, it is not evidence, but if he wants to put it on the record for any personal reason, I am not not going to object.

MR. KRESEL: This second one, your Honor, is with reference to testimony taken in chambers.

THE COURT: Is there agreement about it?

MR. KRESEL: There is agreement about it.

MR. ANDERSON: I have no objection to its going in, sir, if the witness desires it and feels it would be of any benefit to him. I do not see that it has any meaning one way or another.

THE COURT: Let it be embodied in the impounded testimony. That may be handed to Mr. Smart to be added to the testimony taken in chambers.

MR. ANDERSON: The record will show how it was added, that it was sent by Professor Stieglitz, and by agreement of counsel, at his request, was added to the testimony?

THE COURT: This report will show that.

MR. KRESEL: This one, that I am about to hand up to your Honor, is not agreed to by the other side.

THE COURT: The portion of the testimony of Dr. Stieglitz to which you just referred will be on a page marked "Testimony subsequently forwarded."

MR. ANDERSON: Would your Honor mind having it marked "Additional Statement of Dr. Stieglitz, admitted in the testimony on this date, by consent of counsel?"

THE COURT: All right.

MR. KRESEL: The memorandum I am about to hand up to your Honor, Colonel Anderson objects to. Before I hand it up to your Honor, I desire to state that this refers to the occasion when your Honor sent us out the first time, to agree upon an answer to a particular question. With that explanation, I will hand it up to your Honor.

MR. ANDERSON: I wish to say, if the Court please, that the record shows the conditions under which we were sent out, the return, and the answer of the witness, which was read at that time, which I think is complete.

MR. KRESEL: But the record does not show that the answer which the witness read was an answer that was agreed upon between counsel. That is the point that is made by Dr. Stieglitz, and I think is very well taken.

MR. ANDERSON: That is just the part that I do not want, because I did not agree to his answer. I agreed that he might make the answer. I did not object to his making the answer, subject to my general objection, and subject to all other conditions at the time.

THE COURT: I fail to understand just what is intended to be covered by this, Mr. Kresel.

MR. ANDERSON: So do I, sir. Therefore, I object to it.

MR. KRESEL: May I have it, your Honor? I haven't it in mind.

THE COURT: I think probably you can tell me without disclosing the contents of the document.

MR. KRESEL: This refers, your Honor, to the fact that at that conference in the room outside, Professor Stieglitz freely disclosed to the Gov-

ernment counsel what was subsequently disclosed in chambers more at length; in other words, that when he was testifying in open Court here and before there was any mention made of the gentleman whose name was subsequently brought in, the Government knew the facts because Professor Stieglitz had divulged them to the Government the day before. That is the point that the witness is making here.

MR. ANDERSON: To the contrary, we went out—I do not remember the day—under your Honor's order, to talk with Dr. Stieglitz who had the right, under your Honor's direction, either in open court or otherwise, to disclose any information that he had. Your Honor had power, under the express provisions of the Act, to require it.

Your Honor, therefore, in order to protect the information so far as might be deemed desirable, instead of ordering the witness to answer in open court directed us to go into conference with him and see if we could not agree upon a statement which would embody the information the question called for and which would not necessarily disclose the information which it seemed injudicious to disclose without going into chambers to take the evidence.

We went in there. What the question was I do not now recall, and I could not even recall the substance of the answer; but the witness told us certain facts which Mr. Kresel wrote down in the form of an answer, which the witness approved, and we said we had no objection under your Honor's order to that procedure, subject to our general objections. He came back and gave that answer, and that all appears of record. I objected to any further statements or explanations of what took place under those conditions. The record

states what did take place—that we went out under orders of the Court, that we returned, and that the witness gave a certain answer to the question.

MR. KRESEL: I think your Honor better talk with us privately, because I do not think I have made myself plain.

THE COURT: Yes. Won't you come up to the Bench?

(Discussion of Court and counsel then ensued not reported.)

THE COURT: This statement may be embodied in the private record as a part of it:

Colonel Anderson or Mr. Knight, or both, may file a further statement if they desire. If it is questioned, then I shall embody as a part of the record the full statements made by counsel to me in chambers prior to the return of counsel and Dr. Stieglitz to the public Court room and giving the answer which had been prepared in conference with counsel.

MR. ANDERSON: If your Honor please, I hope you will permit me to say that so far as that statement is concerned it is not in the form of evidence and it is not in conformity with my understanding, and if that statement is to go on the record, so far as that is part of the record in this case, I shall ask leave to cross-examine Dr. Stieglitz on it—simply because it is getting into a snarl that is going to embarrass us all before we get through.

THE COURT: I think I can save that, probably, by making my own statement of what transpired.

I do not see any particular good that it does anywhere and I think it can be covered in a way that would not do any harm. I will ask Mr. Smart to come into my chambers after adjournment to-

day and will dictate a memorandum and hand that to counsel.

MR. KRESEL: If your Honor please, the Government concedes that the release and license from the Foundation to the United States Government, covering all of the patents conveyed to The Chemical Foundation by the Alien Property Custodian, was recorded by the Government in the Patent Office on January 15, 1923, in Liber Z 118, page 1, except Schedule E, which refers to copyrights.

MR. ANDERSON: The Government does not concede it in the way it has been put in the statement made. I am perfectly willing to let those two letters go in to speak for themselves. The Government does not concede that it was recorded by the Government or its legal effect.

MR. KRESEL: I am not pleading the legal effect. What do you mean, the Government denies that the Government recorded it?

MR. ANDERSON: I did not say it denied it, but I will not concede it. Whatever the effect is of that statement with reference to depositing that in the Patent Office, by a Rear Admiral of the Navy, is a question for argument. I am perfectly willing that the facts be put on the record, but I will deal with facts when I come to argue it and I will not make any concessions along that line. You can put both of those letters on if you want to and we will argue their legal effect when we get to it.

MR. KRESEL: May I read the letter, your Honor. There is no need of putting it in as an exhibit. It is headed "Navy Department, Bureau of Ordnance, Washington, D. C." It is dated January 11, 1923, and is addressed to Hon. Commis-

sioner of Patents, U. S. Patent Office, Washington, D. C.:

"Subject: Release and License—Chemical Foundation Company, Incorporated.

Enclosures: (A) Release and License.

(Herewith) (B) Schedules A, B, C, D and E.

Sir:

There are herewith forwarded for recording in the assignment records of the Patent Office a Release and License from The Chemical Foundation Company, Incorporated, to the Government of the United States of America together with Schedules A, B, C, D and E.

The Release and License was returned by you when formerly presented in order that the patents specifically included could be incorporated and these patents are enumerated in the schedules above referred to.

"Inasmuch as this Release and License convey certain interests to the Government of the United States, it is believed that no recording fee is required. After recording it is requested that all of these papers be returned to this Bureau.

Very truly yours,

CHAS. B. MCVAY, JR.,
Rear Admiral, U. S. N.,
Chief of the Bureau of Ordnance."

It is conceded at least, is it, that that refers to the release which is now in evidence—or will you not even concede that?

MR. ANDERSON: I will concede that it refers to a certain release and assignment, of what date I do not recall, that you introduced in evidence.

MR. KRESEL: November 17, 1921, Defendant's Exhibit No. 86. The letter that I have just read or a copy thereof is enclosed in a letter dated July 9, 1923, from the office of the Judge Advocate General of the Department of the Navy, directed to Mr. Galloway:

"HERMAN J. GALLOWAY, ESQ.,
Special Assistant to the Attorney General,
Hotel duPont, Wilmington, Del.,

"Sir:

"In compliance with your request there is enclosed a copy of letter dated January 11, 1923, from the Bureau of Ordnance of this Department to the Commissioner of Patents transmitting, for recordation in the assignment records of the Patent Office, a release and license from The Chemical Foundation Company, Inc., to the United States of America, together with Schedules A, B, C, D and E.

"This instrument was recorded in the Patent Office January 15, 1923, in Liber Z-118, page 1, except Schedule E, copyrights.

Very respectfully,
(Signed) J. L. LATIMER,
Judge Advocate General of the Navy."

You need not concede it. I now desire to put upon the record a statement with reference to the several proceedings before Congressional Committees in which the question of the sale of these patents by the Alien Property Custodian to The Chemical Foundation was investigated, and they are these:

The first one was before the House, Ways and Means Committee on H. R. 2706 and H. R. 6495, July 18th to 20th, and July 14th to 18th, 1919. Do you concede it?

MR. ANDERSON: I do not concede that the subject of the sale of these patents was investigated. I do concede that certain evidence was taken in relation thereto.

MR. KRESEL: Very well.

THE COURT: The record shows the document to which reference is made. That will be sufficient.

MR. KRESEL: The next proceeding wherein

the subject was investigated, if I may put it that way, was before the Committee on Finance of the United States Senate, Sixty-Sixth Congress, Second Session, on H. R. 8078, and those hearings were December 8th, 9th, 10th, 11th, 12th and 13th, 1919, and January 12th, 1920.

MR. ANDERSON: Subject to my general objections I am willing to concede that certain statements were made at that hearing with regard to the transaction by certain persons.

MR. KRESEL: The next hearing wherein this subject was discussed if I may so say, was before the Committee on Finance of the United States Senate, on the proposed Tariff Act of 1921, H. R. 7456, those hearings being in the month of August, 1921.

MR. ANDERSON: The same statement with respect to that.

MR. KRESEL: The last hearing was that before the sub-committee of the Committee on the Judiciary of the United States Senate, Sixty-seventh Congress, Second Session, pursuant to Senate Resolution 77, otherwise known as the Shortridge Committee, which was created as a Special Committee to investigate the expenditures made in behalf of various propaganda and in the maintenance of lobbies in Washington, and those hearings began in the month of February, 1922.

MR. ANDERSON: The same statement as to that, sir.

MR. KRESEL: This last hearing is a hearing with reference to an alleged dye monopoly, and is so printed in the record.

If your Honor please, upon the examination of Mr. Garvan, there were two leaflets marked for identification that I omitted to offer in evidence. I desire to do so now. I offer in evidence

Defendant's Exhibit M for Identification and Defendant's Exhibit O for Identification.

MR. ANDERSON: I object for the reason stated as to that character of testimony. It is pure propaganda, if your Honor please, and certainly has no place in this Court.

MR. KRESEL: Your Honor, they are attacking the purposes for which we made expenditures. How is it expected that the Court can pass upon that proposition if the Court has not before it the material that was distributed and for which the money was expended? If counsel will withdraw any such proposition I shall withdraw the exhibit. It is not my purpose to pile up exhibits here.

MR. ANDERSON: To the contrary, I do not withdraw it, and the propaganda or expenses for propaganda have been proved. But I do object to putting into this record a lot of books and publications which were pure propaganda, every one of them. They have no evidential value. They prove by the books they spent $340,000 and they put in a list of the books they sent out covering it. To put all that in evidence in this case, to be used in evidence, is simply loading down this record with propaganda which is not in my judgment admissible under any known rule of evidence, and therefore I object to it most strenuously.

The list of the stuff distributed has been put in, and here is a pile of stuff. We might just as well introduce the Congressional Library into the case, if the Government, or I suppose the taxing power, can stand this kind of expense; but for that it would be practically, if this rule is applied, the denial of justice, because no private litigant of any reasonable means could stand any such procedure.

MR. KRESEL: But it is not a denial of justice

to charge us with wasting money and not permit us to show the Court what we spent it for.

MR. ANDERSON: The list went in.

MR. KRESEL: But the list does not tell the story.

THE COURT: I am afraid I will have to determine whether it is a denial of justice or not. It is admitted.

MR. KRESEL: If there is any way counsel or the Court can suggest whereby this can be before the Court without putting it actually into the record, I would welcome it.

THE COURT: I am going to leave that matter for your consideration, and I shall be very glad if you can find any way to do it.

MR. KRESEL: Then will counsel agree to this——

THE COURT: I will let you confer with Colonel Anderson privately.

MR. KRESEL: Very well.

THE COURT: Now?

MR. KRESEL: Now or hereafter.

THE COURT: You might ask him now, but probably you can save the time, both of you, by discussing it together rather than aloud.

MR. KRESEL: All right.

MR. ANDERSON: I know what counsel wants to do. I am perfectly willing, if your Honor please, to take all this stuff that has been introduced here, and agree that counsel may use it, bring it and exhibit it in this court as stuff distributed by The Chemical Foundation; that they can take it up to the upper court and exhibit it to the upper court as stuff distributed by The Chemical Foundation. But I do object to its going into the record in evidence in this case. I have not the slightest desire

to cut off The Chemical Foundation from showing any expenditure of a dollar or less or more.

Mr. Kresel: I think, your Honor, I will make one suggestion, if Colonel Anderson will agree to it, very well. If not, we will have to find some other way. I propose that each of these books be given an exhibit number and be considered as in evidence, but that none of them should be printed in the record, each side being at liberty to refer thereto and to hand up a copy thereof to this Court or to any appellate court before which this case may come.

Mr. Anderson: If counsel will state what the typewritten memorandums on the front represent and what they mean—I retain my objection to their being introduced in evidence, but if the Court rules that they can go into evidence, then I am perfectly willing right now to agree that they shall not be printed in the record, and that they may be handed up and referred to in any legitimate way that they can be, in this or any other Court. I understand in any event they could not be used as proof of the facts contained therein, but only as proof that they were distributed.

The Court: They are physical exhibits, really. Their contents are not assumed to be true or untrue. They are simply the copies of the matter which the defendant has been engaged in distributing.

Mr. Anderson: But the contents have no evidential value at all, except to prove that the Chemical Foundation has distributed them.

The Court: Has or has not been carrying out the purposes of its charter, as far as I can see.

Mr. Kresel: May I suggest that inasmuch as there is quite a list, that your Honor permit us——

MR. ANDERSON: Will you state, Mr. Kresel, what those papers are, because I do not want to have to put somebody on the stand. There are typewritten papers on each one of them.

THE COURT: That is a summary of Mr. Garvan's testimony, I suppose, because I observed him using these documents when he was testifying.

MR. KRESEL: Yes, sir.

MR. ANDERSON: With that understanding, Mr. Kresel, if the Court rules that they can go in—I understand the Court has so ruled, and I have no desire to discuss it—if they are admitted in evidence, reserving all of the objections to them, I am perfectly willing that they should not be printed in the record—I would earnestly object to their being printed in the record—and that counsel on either side may use them in any way that they could use them if they were printed in the record under the ruling of the Court, I do not care what way.

MR. KRESEL: That is quite agreeable.

MR. ANDERSON: And with the express reservation that I understand that they are introduced for the limited purpose of showing only that they were distributed by The Chemical Foundation.

THE COURT: And the character of the books and booklets distributed by it.

MR. ANDERSON: Of course, I assume that.

THE COURT: That is the real purpose.

MR. KRESEL: May I prepare a list thereof tonight and present it to counsel, so that they may pass upon its correctness, and I will put it on the record tomorrow? I do not want to stop now.

THE COURT: Yes.

MR. KRESEL: I now offer in evidence a statement showing a list of the original subscribers to

the underwriting of the stock of The Chemical Foundation, Inc., as to those who were members of the Dyes Institute and to those who were not members of the Dyes Institute, the list being divided.

MR. ANDERSON: I object on the ground that it is not evidence unless it is in the record. If it is in the record, then it is already in evidence.

MR. KRESEL: It is not in the record.

MR. ANDERSON: And the exhibits introduced in this record and filed with the bill show who were the members of the Dyes Institute and also show who were the underwriters of The Chemical Foundation. Therefore, this is not admissible.

MR. KRESEL: No, Colonel Anderson, you are in error. The records introduced do show who were the stockholders; but the records introduced do not show who were the members of the American Dyes Institute, and that is the purpose of this exhibit.

THE COURT: The objection is that that exhibit must be proved.

MR. KRESEL: Very well; I am forced to call a witness on that point. Mr. Corwine can tell.